NATIONAL ACADEMY OF SCIENCES
Handbook of Laboratory Animals 1954

3234

1. animal resources
2. nutrition
3. laboratory animal diseases
4. " " supply
5 " " exchange

(FW)

HANDBOOK
OF
LABORATORY ANIMALS

Prepared by the
INSTITUTE OF ANIMAL RESOURCES

COMMITTEE ON HANDBOOK
H. G. HERRLEIN, *Chairman*
G. B. COURSEN
R. RANDALL
C. A. SLANETZ

Publication 317
NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL
Washington, D. C.
1954
Price—$1.25

Contents

PREFACE

Animals are a prime scientific commodity. Being used by the millions in biological work and its ramifications in agriculture, medicine and public health, for research, teaching, testing, assaying, and manufacture, their production, procurement, definition, maintenance and health have become a matter of "scientific logistics", hence in need of methodical attention according to rigorous scientific standards. Realizing this need, the Division of Biology and Agriculture of the National Research Council, with the considerate and generous support of many private and public agencies and of the trades and industries concerned, set up in 1952 an *Institute of Animal Resources* to act as a clearing house for the collection, correlation, evaluation and dissemination of useful information already available, as well as for the initiation and conduct of such additional measures as may be called for in a broadly conceived, forward-looking program of this nature.

Specifically, the aims of this organization are:

(1) To survey and list existing sources of animal stocks used in biological (including agricultural, medical and industrial) research, testing, and assaying; and to determine the consumers and the volume of demand for such material.

(2) To perpetuate this activity by taking periodic inventories and keeping alive master registry of those sources, for distribution to all interested persons and groups of consumers (e.g., research laboratories, academic institutions, government agencies, industrial and trade establishments, etc.).

(3) To promulgate scientific standards of definition, terminology, and tolerable variability in regard to genetic constitution, nutrition, freedom from disease, housing conditions and maintenance for the major groups of animals in use.

(4) To act as a liaison center on information regarding the detection, preservation and perpetuation of new or old strains of special importance for specific problems (e.g., cancer).

(5) To devise measures for insuring adequate supplies of needed animal stocks in states of emergency (war, epidemics, etc.).

(6) To assist in the organization and facilitation of international exchange of needed animal stocks.

The present *Handbook* is a first step in the implementation of this program, especially that part of it aiming at the assemblage of existing information of value to producers, collectors, distributors and users of animals. Being no more than a first step, its content is preliminary, fragmentary, and even within each fragment, incomplete. It merely presents the information contributed by users and producers of laboratory animal stocks in reply to questionnaires sent to these respective groups. The Institute does not endorse any stocks listed or claim accuracy for any of the statements made relative to the various stocks. These are matters which will have to be worked out in later and more detailed surveys. Documented information concerning the historical background of present animal stocks and the breeding, maintenance and specific uses of laboratory animal stocks is of prime importance, and will be sought after for future presentations.

In addition to the information resulting from the survey, brief paragraphs are presented treating of some of the most often encountered laboratory animal diseases. Finally, bibliographies of several references are given relating to animal care and management, disease, nutrition and some of the uses for which certain animal stocks have been found satisfactory.

HARRY G. HERRLEIN, Chairman
Committee on Handbook

GENETIC STANDARDS

In compiling the material for this Handbook, all those concerned recognized the fact that a vast amount of diverse information on stocks of laboratory animals would be obtained. The Committee on Genetics realized, that, because of the number of colonies in existence, and because of a variety of breeding systems used, many different genetic conditions undoubtedly existed. Furthermore, since biological research is so diversified, a great many different kinds of research materials are required, each of which must frequently have its own genetic standard. Thus it seemed to the Committee that the promulgation of rules and regulations for genetic standards would be very difficult and perhaps not advisable at this time.

Consequently, the Committee thought it would be of more help to the users of this Handbook if the genetic situation for each stock was described. Thus by describing the existing strains or stocks we will, in a sense, be listing various genetic standards. If this description is a complete one, giving as much information as is known about the origin, development, and uses, then the research investigator can pick from the listing the kind of stock suited to his research needs.

This is the plan that has been carried out with the information so far available. The description includes the name and/or symbol, origin, system and extent of breeding (if possible), characteristics and uses, by whom maintained, and availability. The names and/or symbols already in existence for the various strains and stocks were kept without change. It will be noted that frequently stocks with the same name and/or symbol are listed by several suppliers. In these cases descriptions are given for each as far as possible, for it is entirely likely that even though several stocks or strains bear the same label they may differ in their genetic conditions, especially if they have been separated from a common source for any length of time.

In those stocks, where inbreeding is indicated it is assumed that this inbreeding has been by brother × sister matings, unless otherwise stated. Because of the lack of information in this initial listing, no attempt has been made to determine the amount or extent of inbreeding or the amount of homozygosity in those stocks listed as closed colonies. It should be assumed that in such colonies some inbreeding has occured, and hence some genetic homozygosity does exist. Until additional information is available, estimates of these facts cannot be made. Those stocks listed as open stocks, random bred stocks, or stocks where new breeders are periodically introduced no doubt will exhibit maximum genetic variation, with little or no inbreeding.

In this first Handbook it is hoped the information will be sufficient to illustrate the value of such a listing. There are gaps in the information which should be filled in so that eventually complete genetic descriptions will be available. We welcome any suggestions that either the user or the supplier would care to make, for we strongly feel that such information will be of considerable value to both. The user will know what kinds of animals are available and where they can be obtained; the supplier will know who the users are, and what they use, and will thus be better able to adjust his production to meet the demands.

GEORGE E. JAY, JR., Chairman
Committee on Genetics

NUTRITION

The importance of adequate nutrition in the production and maintenance of laboratory animals is recognized by producers and users alike. Renewed interest in the problem has stemmed from certain very practical considerations relative to the role proper nutrition plays in producing animal stocks which will meet the exacting standards of modern research. In the field of nutrition the Institute of Animal Resources hopes to give guidance on stock diets; particularly to the producers of research animals so that the material will be acceptable for a variety of purposes.

Among the several controversial subjects concerning natural food stock diets, the question of chemical additives has been in the limelight. Reference here is made to the addition of antibiotics, antibiotic residues, sulfa drugs, and certain other chemical additives. Many users of laboratory animals require animals which have no previous history of antibiotics, drugs, or other chemical additives feeding. Suppliers should determine whether or not any commercial diet they use contains antibiotics, drugs or other chemical additives and the kind and amount of such substances in the feed. If suppliers use such substances in their animal diets, users should be informed of the use of these substances.

The question of protein availability in animal feeds is receiving much attention since the value and the cost of a diet are reflected not only in the amount of crude protein, but also in the percentage of high quality animal protein, as well as in the combination of plant and animal proteins. Unless the proper proportions of high grade animal protein foodstuffs and plant protein ingredients are used, the stock diet may have proteins of low availability even when the crude protein figure is satisfactory.

It may be stated generally that many workers consider a range of 20 to 26% available protein in a stock diet to be adequate for mice, rats, hamsters, cats, dogs and monkeys. Guinea pigs and rabbits, however, seem to require less protein in their stock diets. Some workers feel that a range of 17 to 20% protein is adequate for the latter species.

Unfortunately, to date, published work on nutrition of small laboratory animals has been confined largely to purified diets. It should be emphasized that one is not able to translate results obtained from purified diet studies directly to natural foods stock diet values. At the present time work is in progress to determine nutrition requirements of laboratory animals, using commercial pelleted diets suitably supplemented. A number of rat nutritionists have agreed that the commercial diets now available are not equal to a complete purified diet designed for rats, but the cost of purified diets is prohibitive.

For reproduction purposes, preliminary experiments indicate that ordinary stock diets in which suitable natural supplements have been incorporated will give adequate and optimal nutrition.

As an example of the complexities which arise in the formulation of stock diets, one can take the use of a commercial fish meal. At 10% level fish meal proves satisfactory as a source of high quality, low cost animal protein, but 20% fish meal in a natural food stock mouse diet produces adverse results, interfering with reproduction and growth. Rats seem to be less adversely affected. Likewise yeast fed at a 5% level proves beneficial, but higher percentages (10–15)% give unfavorable results. In rabbit diets soybean oil meal (new process) at high levels has proved toxic. Much work remains to be done on stock diet formulae. However, there are in the market pelleted stock diets which have produced uniform results and proved generally satisfactory for rats and mice even when fed exclusively over a period of fifteen years or more.

The feeding of stock diets in pelleted form instead of mash to reduce contamination of food is an important consideration. Pasteurization, autoclaving or otherwise heating stock diets result in destroying some food values and may cause imbalance which unfortunately cannot be corrected by such supplements as bread and milk. The answer to many of these problems will have to be obtained by suitable rat and mouse bioassays. Subsequent issues of the Handbook will contain suggestions and

information which the Committee hopes will prove constructive and helpful.

Sample rations for rat, mouse, guinea pig and rabbit

Although the feeding of pelleted diets is the practice of choice in most laboratories there are occasions when for experimental or other reasons the feeding of a mash diet is necessary.

The following mash diets are examples of the type found satisfactory in a number of institutions for stock animals and colony maintenance.

Mouse and Rat Diet	%
Whole milling wheat (ground)	25
Yellow Corn (ground)	15
Soybean oil meal	20
Whole milk powder	20
Fish meal, high grade, 63% protein	10
Corn oil	6
Alfalfa leaf meal	2
Sodium chloride	1.5
Calcium carbonate	0.5

Guinea Pig and Rabbit Ration*	
Whole wheat ground	50
Alfalfa leaf meal	30
Soybean oil meal	15
Corn oil	3
Bone meal	2

* It is necessary to supplement the guinea pig ration with a source of Vitamin C either in the form of vegetable, such as lettuce, cabbage, carrots or ascorbic acid given orally. In addition it is desirable to provide Timothy hay or hays of similar grade as a further supplement to the diet.

CHARLES A. SLANETZ, Chairman
Committee on Nutrition

There seems to be a lack of information on the nutrition of the hamster. The following references give information on this subject.

Vitamins and Hormones: Advances in Research and Application. Edited by Robert S. Harris and Kenneth V. Thimann. Vol. VI 1948. Contains a chapter on "Nutritional Requirements of the Cotton Rat and Hamster" by B. S. Schweigert.

HAMILTON, J. W. AND HOGAN, A. C. 1944. Nutritional requirements of the Syrian hamster. Jour. Nutr. 27 (3): 213–224.

HOUCHIN, O. B., Vitamin E and muscle degeneration in the hamster. Fed. Proc. (Fed. Amer. Soc. Expt. Biol.) 1, (no. 1), pt. 2, pp. 117–118, 1942.

Some nutritional requirements of the hamster. J. I. Routh and O. B. Houchin, (Same as above) pp. 191–192.

The following are references on the nutrition and feeding of dogs.

EARLE, IMOGENE P., Nutritional Requirements of Dogs. U.S.D.A. Year Book, 1939. pp. 844–855.

Speelman, S. R., Feeding Dogs. U.S.D.A. Year Book 1939. pp. 856–870.

KREHL, W. A., Research developments in dog nutrition. Jour. Am. Vet. Med. Assn. 110: 121. 1947 (Vet. Bull. 21: 2650, 1951).

DISEASES OF LABORATORY ANIMALS

The Committee on Parasitism of the Institute of Animal Resources was organized to collect, coordinate, appraise, and disseminate information relative to infections and infestations of laboratory animals, to the end that diseases of laboratory animals may be effectively controlled. The interpretation of the word "control" may take on a varied meaning. An attempt will be made, in the present listings, to suggest briefly an acceptable method of control for the most "important" diseases of each species considered.

It is our duty, however, to advise our readers that there are some research projects that demand that mice be free of Salmonella, that rabbits be free of coccidiosis or that rats be free of virus pneumonia. At the same time we know of no commercial producers who can supply such animals. What then, can commercial breeders of laboratory animals do about these problems? Livestock breeders know that animals in a good state of nutrition, and in clean and acceptable surroundings, can develop immunities to certain organisms that are pathogenic to their species, and can survive, thrive, and even multiply though these pathogens have become ubiquitous to their premises. But they also know that under adverse conditions of environment, under conditions of stress, the equilibrium will be disturbed and these same pathogens will become a serious problem. Commercial breeders of laboratory animals should accept the fact that in certain lines of biological research laboratory animals are used for the express purpose of subjecting them to stress, and that for these reasons the concept of tolerating certain diseases previously considered controllable must be reexamined. Commercial laboratories should heed the increasing tendency on the part of laboratories to raise their own mice in an attempt to obtain Salmonella-free colonies, coccidiosis-free and snuffles-free rabbits. It is difficult to study the physiological effects of radiation in a mouse that, with lowered immunity induced by radiation, will die of salmonellosis or study the effects of lowered protein intake in a rabbit, that, with lowered immunity induced by malnutrition, will die of coccidiosis.

It is recognized that an outstanding weakness in the control of diseases in laboratory animals is diagnosis, and that the problem of obtaining laboratory and professional aid must be solved by the producer.

The control of disease in laboratory animals cannot be pursued haphazardly. Rats and mice should not be allowed to escape from cages, and a continuous program of caution and of extermination must be carried on against the possibility that some rodents have escaped, and against the possibility that wild rodents may have been introduced with feed or bedding. Flies, mosquitos, and bedbugs should not be tolerated in the animal rooms, and special precautions may be indicated against the introduction and propagation of these and of the species specific arthropods (lice, ticks and mites) that would make disease control a difficult, if not an impossible undertaking.

Cleaned and "sterilized" or fumigated cages should be used whenever animals are changed to "new" cages, and these changes should be made every 21 days or oftener, most laboratories preferring to change cages at least once a week.

Prepared feed should be purchased frequently, so that it will always be fed in a relatively fresh state. Dry feeds should be received in multiple-layer paper sacks that are neither broken nor opened. Once the feed bags are opened, their contents should be emptied and stored in metal bins or containers, and kept covered. Feeds that are infested or contaminated should be discarded, as grain weevils have been found to be disease vectors.

The release presented herewith is abbreviated and incomplete. It represents, more than anything else, a listing of those diseases that, in the judgment of the Committee on Parasitism, have been the problem diseases of the laboratory animals most commonly in use. Further information will be found in the references cited and in future reports.

N. R. Brewer, Chairman
Committee on Parasitism

Diseases of the Chicken

REFERENCE: Biester, H. E., and Schwarte, L. H. "Diseases of Poultry". The Iowa State College Press (1952).

AVIAN LEUKOSIS COMPLEX. The avian leukosis complex as usually understood includes primarily those diseases which are characterized by autonomous proliferation of essential blood forming cells, namely neural, ocular, visceral, and osteopetrotic lymphomatosis, erythroblastosis, granuloblastosis, and myelocytomatosis. The etiological agent is believed to be one or more oncogenic viruses. Apparently transmitted by direct or indirect contact and possibly by an insect vector.

CONTROL—Control consists of selective breeding, care in the selection of new stock, sanitation, and ectoparasite control.

FOWL POX. A contagious disease caused by a virus which may manifest itself in two slightly different ways depending upon the strain of virus involved: (1) wart-like lesions of comb, wattles and face; (2) localization of the infection in the nasal chambers.

CONTROL—The disease may be controlled by isolation; however, satisfactory methods of vaccination have been developed.

NEWCASTLE DISEASE. Syn: Avian Pneumoencephalitis. An infectious, highly contagious disease caused by a filtrable virus. In young chicks the disease is characterized first by respiratory symptoms and later, after one or two days, by central nervous disorders including ataxia, head tremors, lack of coordination, and leg paralysis. In older chickens, the disease is characterized by a drop in egg production, coughing, dyspnea, inappetence, and frequently by central nervous disorders.

CONTROL—Control can be accomplished best by strict isolation and sanitation; however, vaccination may be used if properly and wisely employed.

INFECTIOUS LARYNGOTRACHEITIS. An acute, contagious, respiratory disease caused by a filtrable virus and characterized by gasping, rales, coughing and usually affecting older chickens.

CONTROL—Control consists of strict sanitation, the purchasing of only clean animals for additions, and in immunization where indicated.

AVIAN ENCEPHALOMYELITIS. Syn: Epidemic Tremors. An acute infectious disease usually affecting young chicks, caused by a virus and characterized by a variable incubation period, a dullness of the eyes, unsteady gait, ataxia, weakness, and tremors of the head and neck.

CONTROL—The disease is controlled by isolation and the removal of infected birds.

CHRONIC RESPIRATORY DISEASE. An infectious disease caused by pleuropeumonia-like organisms or a virus and characterized by rhinitis, sinusitis, laryngitis, tracheitis, bronchitis, pneumonia, and aerosacculitis.

CONTROL—Slaughter and isolation seem to be the only means of control at the present time. Since the disease can be transmitted through the egg, it is important that replacement chicks be obtained from flocks free of the disease.

INFECTIOUS BRONCHITIS. An acute, highly contagious, respiratory disease, caused by a filtrable virus and characterized by gasping, rales, coughing, swollen sinuses, nasal discharge, and usually affecting young chicks.

CONTROL—Control consists of strict sanitation and isolation of the flock and the elimination of all infected birds.

ORNITHOSIS. A subacute infectious disease of chickens caused by a large elementary body virus, which is pathogenic to man. Infected birds may show weakness, anorexia, emaciation, ruffled coat or may show no symptoms or lesions at all.

CONTROL—The control of this disease is based upon isolation, quarantine, and by the laboratory diagnosis and the destruction of infected birds.

FOWL PLAGUE. Syn: Fowl Pest. An acute highly infectious disease caused by a virus and characterized by sudden onset, weakness, inappetence, cyanosis of head and wattles, edema of head and upper respiratory tract, mucous exudates from nostrils, diarrhea, prostration, coma, and usually death.

CONTROL—The disease is controlled by quarantine, slaughter, and disinfection.

MONILIASIS. Moniliasis is caused by *Candida albicans*, a yeast like organism which is world wide in distribution. Since the organism forms part of the normal flora in the gastrointestinal tract of animals and occurs also in the skin, great reservation must be applied to the finding of the organism in pathologic lesions. Lesions are found especially in the crop

in the form of white membranous lesions. The disease is epizootic in chickens.

ASPERGILLOSIS. A disease mostly seen in birds and caused by some of the species of Aspergillus. It may produce dyspnea, or eye infections leading to corneal ulceration may result.

CONTROL—No specific treatment is known. The fungi are found on grain, straw, hay, etc., and is possibly inhaled from these sources. Extreme cleanliness apparently will prevent epizootic spread of the disease.

TAPEWORM. (*Syngamus trachea*) of chickens is a roundworm that matures in the trachea of chickens, and may have a direct or indirect life cycle, in which snails, slugs, and earthworms act as intermediate hosts.

CONTROL—Proper disposal of fecal droppings. Prevent exposure of chickens to infected chickens and contaminated land.

ROUNDWORMS OF THE CHICKEN (other than *S. trachea*). The economically important roundworms of chickens that inhabit the gastro-intestinal tract are *Ascaridia galli*, *Ascaridia columbae*, *Dispharynx nasuta* (in the proventriculus), *Capillaria caudinflata*, and *Capillaria columbae*. The life cycle of three of these roundworms (*A. galli*, *A. columbae*, and *C. columbae*) is direct. *D. nasuta* requires the pill bug or the sow bug as intermediate hosts to complete its life cycle, and *C. caudinflata* requires earthworms as an intermediate host to complete its life cycle.

CONTROL—Proper disposal of fecal droppings.

TAPEWORMS. *Hymenolepis carioca* (using various beetles as intermediate hosts), *Davainea proglottina* (using the slug, *Agriolimex agrestis* as the intermediate host), *Raillietina cesticellus* (using dung beetles as intermediate hosts), *Raillietina tetragona* (using various ants as the intermediate host), *Raillietina echinobothria* (using ants as the intermediate host), and *Choanotaenia infundibulum* (using beetles, a grasshopper, and the common housefly as intermediate hosts) are tapeworms that are known to infest chickens.

CONTROL—Dispose fecal droppings so that intermediate hosts do not have access to them.

FLEAS. Chickens are susceptible to infestation by two types of fleas: the sticktight flea, *Echidnophaga gallinacea*, and the western hen flea, *Ceratophyllus niger*.

CONTROL—Application of DDT or sodium fluoride will usually serve to rid the chicken of fleas. Care should be taken to also rid living quarters of the fleas and to prevent reinfestation by infected animals.

LICE. The species of lice that may infest the chicken are: the shaft louse, *Menopon gallinae*, the wing louse, *Lipeurus caponis*, the large hen louse, *Goniodes gigas*, the head louse, *Lipeurus heterographus*, the body louse, *Menacanthus stramineus*, the fluff louse, *Coniocotes hologaster*, and the brown chicken louse, *Goniodes dissimilis*.

CONTROL—Sodium fluoride dip or dust, nicotine sulfate on roosts, sulfur dust and DDT will effectively control lice. The living quarters should be treated as carefully as the animals so that reinfestation will not occur. Parathion spray and dust are also effective.

MITES. Chickens are commonly attacked by several species of mites: the common mite, *Dermanyssus gallinae*, the feather mite, *Bdellonyssus sylviarum*, the scaly leg mite, *Cnemidocoptes mutans*, chiggers, *Eutrombicula alfreddugesi*, and the depluming mite, *Cnemidocoptes gallinae*.

CONTROL—Sulfur bath, nicotine sulfate on roosts, dipping legs in crude petroleum, sulphenone (R-242), benzene hexachloride or lindane, pentachlorophenol, valone are all chemicals which will provide a certain measure of control. Care should be taken to rid chicken house and roosts of these pests also as chickens may become reinfested.

TICKS. The fowl tick, *Argus persicus*, may be found as a parasite on chickens.

CONTROL—Treatment with DDT and use of carbolineum spray in the chicken house are methods of control of these ticks.

Diseases of the Mouse

REFERENCE: Biology of the Laboratory Mouse, Snell, Philadelphia: Blakiston Co., 1941, p. 370.

ECTROMELIA (Mouse pox). An important epizootic of mice in England and other countries. This filterable virus disease has been diagnosed in several laboratories in the United States. In the acute type death may occur in as brief an interval as four hours, and the mortality rate may reach 80–90%. In chronic cases there is a pox lesion of the skin, an en-

largement of a limb due to edema, usually followed by gangrene of a toe or foot.

VIRUS PENUMONIA. Virus pneumonia in mice is usually a latent infection that may become activated under conditions of stress or debility.

LYMPHOCYTIC CHORIOMENINGITIS. A virus disease of mice, infective for man, that may cause lameness of the hind legs.

SALMONELLOSIS. Salmonellosis (Mouse Typhoid) is a disease of mice caused by a large group of organisms within the genus *Salmonella* causing varying degrees of debility up to septicemia and death.

CONTROL—Control of the infection, once established, can only be of a temporary nature, principally by reduction of transmission through sanitary means, division of animals into small groups, elimination of animals in contact with actual infection, and strict attention to the problems of wild rodents and insects. Vaccines prepared from killed microorganisms have been used. In epizootics with high mortality they may stimulate sufficient antibody production to cause a decrease in the number of deaths. However, vaccination does not eliminate the disease or infection from the colony.

HEMORRHAGIC SEPTICEMIA. Hemorrhagic septicemia is a disease of mice caused by *Pasteurella multocida*, usually leading to death within a few hours after the onset of symptoms. Mortality is said to vary between 75 and 100%. *P. pseudotuberculosis* and *P. pestis*, important diseases, are not common in laboratory mice. Jawetz has described a pneumotropic pasteurella widely distributed in colonies of mice, rats, and guinea pigs.

CONTROL—Control of pasteurella infections in mice is directed toward eradication by general preventive methods including removal of contacts or, if necessary, elimination of part or the whole of the colony. Colonies of mice should have adequate separation from guinea pigs, rats, and other animals in which infections with hemolytic streptococci or *Bact. bronchisepticum* may occur in enzootic or epizootic proportion. Control measures should include prompt recognition of the desease and removal and necropsy of infected and contact animals to determine the extent of the infection.

CORYNEBACTERIUM KUTCHERI INFECTION (pseudotuberculosis). *C. kutcheri* is one of those organisms that cause lesions in mice that are similar to tuberculous lesions. Its development depends on a weakened condition of the host, such as that produced by irradiation, or by infection with another pathogen.

ERYSIPELOTHRIX INFECTION (Mouse septicemia). Mouse septicemia is an infrequent disease, reported sporadically and epizootically, and caused by *Erysipelothrix muriseptica*, a microorganism having morphologic, cultural, and serologic characters of the microorganism causing swine erysipelas. Mice and rats are susceptible to infection; guinea pigs and rabbits are resistant. The first sign of illness is a serious conjunctivitis followed by a purulent exudate with gluing together of the eyelids. Animals show arching of the back, anorexia, and constipation.

CONTROL—General preventive measures, including removal and destruction of immediate contacts.

STREPTOBACILLUS MONILIFORMIS INFECTION. A disease that may assume an acute, a subacute, or a chronic form in mice. When acute, it is septicemic with high mortality. Conjunctivitis is usually present. In subacute and chronic forms, swollen joints, with edema of the extremities and tail are characteristic. Paralysis of hind legs, ulceration of the feet, enlargement of lymph nodes, and submaxillary abscesses may be present.

CONTROL—Prompt isolation or destruction of diseased animals and contacts and general sanitary preventive measures are advisable.

BACILLUS PILIFORMIS INFECTION (Tyzzer's disease). A disease noted in Japanese waltzing mice and in Swiss mice, but with an apparent limited host susceptibility. It causes multiple foci of necrosis in the liver.

CONTROL—Infection of susceptible mice occurred from contact with infected animals or contaminated cages. A contaminated cage remained infective after one year at room temperature. Porter was unable to transmit the infection to other mice by contact or feeding.

KLOSSIELLA MURIS INFESTATION. This is a sporozoan found in the epithelial cells of the convoluted tubules of the kidneys. The developmental cycle takes place in the endothelial cells of the capillaries of the glo-

meruli and in epthelial cells of the convoluted tubules. Mature spores are passed in the urine of the infected mouse. It is a frequent cause of nephritis in the mouse.

CONTROL—Prevent contamination of feed and water by urine from infected mice.

HYMENOLEPIS DIMINUTA. See *Hymenolepis diminuta* of the Rat.

HYMENOLEPIS NANA. See *Hymenolepis nana* of the Rat.

LICE. The common louse that attacks mice is *Polyplax serrata.*

CONTROL—Application of sodium fluoride or pyrethrins will usually rid the animal of these parasites. Care should be taken to clean out cages and bedding and to prevent reinfestation from contact with infested animals.

FLEAS. Mice are subject to attack by three species of fleas: *Ctenopsyllus segnis*, the mouse flea, *Leptopsylla musculi*, the European mouse flea, and *Nosopsyllus fasciata*, the American rat flea.

CONTROL—Application of rotenone will serve to rid the animal of these parasites. Care should be taken to keep cages, bedding and other animals from being the cause of reinfestation.

MITES. Mice may be infested with several species of mites; *Bdellonyssus bacoti*, the tropical rat mite, *Echinolaelaps echidninus*, *Myobia musculi*, or *Myocoptes musculinus*, causing loss of condition.

CONTROL—Application of pyrethrins or rotenone will usually rid the animal of these parasites. Cages and bedding should also be treated and care taken that reinfestation does not occur from contact with infested animals.

Diseases of the Rat

REFERENCE: Farris, E. J., and Griffith, J. Q. Jr., "The Rat in Laboratory Investigation, 2nd Edition. J. B. Lippincott Co.

ENDEMIC PNEUMONIA (Nelson) (virus pneumonia). Virus pneumonia of rats is a chronic disease of rats of slow progression. It is carried by breeders in almost all colonies, and is transmitted to their young shortly after birth.

CONTROL—There is no control possible, unless new rats are procured by Caesarian (and hand fed for 2 to 3 weeks), all of the rest of the colony killed, and the quarters maintained in strict isolation and under strictly sanitary conditions.

SALMONELLOSIS (paratyphoid). Salmonellosis is less a problem in rats than it is in mice or guinea pigs. (See Salmonellosis in mice.)

HAVERHILL FEVER (rat bite fever). This disease is caused by *Streptobacillus moniliformis*, which organism occurs in the nasopharynx of "normal" rats but is highly infective for rats and mice on injection. It can be transmitted to other animals and man by the bite of an infected rat. It causes joint swelling, ulceration of the feet, and bulbous swelling of the tail, but acute forms often die without symptoms.

INFECTIOUS CATARRH. Infectious catarrh of rats is caused by pleuro-pneumonia-like organisms (Klineberger-Nobel) and is a disease of slow onset and long duration, involving the middle ears, the lungs, and the nasal passages.

KLOSSIELLA MURIS INFESTATION. (see Klossiella muris infestation of the Mouse.)

HYMENOLEPIS NANA. *Hymenolepis nana* is a tapeworm of the rat, to which man is susceptible, that has a life cycle that may be direct or indirect. The indirect life cycle is mediated by the ingestion of a number of different species of insects, including fleas and beetles.

CONTROL—Since man is susceptible, and since this parasite has a direct life cycle, care should be taken against contaminating the hands of the diener with fecal material. Animals should be kept free of ectoparasites and feed-bins must be protected from meal beetles.

HYMENOLEPIS DIMINUTA. *Hymenolepis diminuta* is a tapeworm of rats and mice with an indirect life cycle, requiring cockroaches, beetles, fleas, and grain eating arthropods as intermediate hosts.

CONTROL—Prevent ectoparasites from infesting animals, and prevent grain-eating insects from getting into feed.

MITES. Rats may be attacked by the mange mite, *Myobia ratti*, the rat mite, *Bdellomyssus bacoti*, the mange mite *Notoedres minor* var. *cati*, and the ear mite *Otodectes cynotis.*

FLEAS. Rats may be attacked by five species of fleas: *Nosopsyllus segnis*, the American rat flea, *Echidnophaga gallinacea*, the sticktight flea, *Xenopsylla cheopis*, the Indian rat flea,

Ctenopsyllus segnis, the mouse flea, and *Hematopinus spinulosis*, the rat flea.

CONTROL—Application of rotenone dust will usually rid the animal of fleas but cages and bedding should also be treated and care taken to prevent reinfestation from contact with infested animals.

Diseases of the Guinea Pig

REFERENCE: Meyer, K. F., and Eddie, B. Disease Problems in Guinea Pigs, in Proceedings of the Third Annual Meeting of Animal Care Panel, December 3–4, 1952. Chicago; Illinois pp. 23–39.

SALIVARY GLAND DISEASE. Salivary gland disease is a virus-induced inflammation of the salivary glands of guinea pigs that may show symptoms under periods of stress or debility. Recovered animals are immune.

CONTROL—None known.

PNEUMONIA. Pneumonia in guinea pigs is caused by *S. pneumococci* types III and IV. When the incidence reaches epizootic proportions, the mortality may be high.

CONTROL—Sacrifice sick animals.

SALMONELLOSIS (paratyphoid). Salmonellosis is a disease of guinea pigs, sometimes reaching plague proportions, caused by species of the Salmonella group of organisms, chiefly *S. typhimurium* and *S. enteritidis*.

CONTROL—Use rodent proof and rodent free (other than those in cages) animal quarters. Do not use wooden cages. Thoroughly disinfect the premises and the metal cages. Prevent food from insect and rodent contamination. Carefully select breeding animals by skin tests, serum tests, and by culturing droppings of pregnant females.

KLEBSIELLA PNEUMONIA. Klebsiella pneumonia is a fairly common infection of guinea pigs which usually runs a chronic course during which the animal becomes emaciated, wheezes, and develops a purulent nasal discharge.

CONTROL—Sacrifice sick animals. Isolate those animals that have been in contact with sick animals.

STREPTOCOCCUS INFECTIONS. Streptococcus infections in guinea pigs are caused by hemolytic type streptococci. Peracute types cause septicemia and are rapidly fatal. More chronic types cause pyogenic infections, usually involving lymph nodes.

CONTROL—When an infection occurs, sacrifice the whole cage. Practice sanitation to prevent spread from the infected cage.

PSEUDO-TUBERCULOSIS. Pseudo-tuberculosis of guinea pigs is a disease caused by *Pasteurella pseudo-tuberculosis* and manifested chiefly by emaciation, diarrhea, and enlarged lymph nodes. Peracute cases may die in 24 hours from the septicemic form of the infection, and the disease may take a more chronic course manifested by enlarged lymph nodes.

CONTROL—Sacrifice all sick animals. If a member of a litter is infected, sacrifice all the litter and the sow.

PASTEURELLOSIS (hemorrhagic septicemia). This relatively rare disease of guinea pigs, caused by *Pasteurella aviseptica* has been known to destroy a whole colony of guinea pigs in 48 hours.

CONTROL—Eradication of the colony.

BRONCHISEPTICUM. This fairly common disease of guinea pigs is caused by *Brucella bronchiseptica*. It elicits the usual symptoms of respiratory infections.

CONTROL—Sacrifice infected animals.

EIMERIA CAVIAE INFESTATION. This protozoan has an endogenous cycle that takes place primarily in the colon and is completed in 18 to 31 days. Animals manifest clinical symptoms of coccidiosis—as, lack of appetite, weakness, emaciation and a severe diarrhea containing blood tinged mucus or blood.

CONTROL—Prevent contamination of the feed and water with sporulated oocysts and clean cages regularly.

LICE. Two species of lice commonly infest guinea pigs: *Gyropus ovalis* and *Gliricola porcelli*. Infestation may result in emaciation and rough hair coat.

CONTROL—Careful application of DDT or lindane will usually rid the animal of these parasites.

Diseases of the Rabbit

REFERENCE: Blount, W. P. *Rabbits' Ailments*. Published by "Fur and Feather," Idle, Bradford, England, 1945.

PAPILLOMATOSIS. An infectious disease of rabbits caused by an oncogenic virus (Shope) and characterized by wart-like pedunculated

tumors of the skin, some of which may become malignant and metastasize.

CONTROL—Although specific immunity can be developed by intraperitoneal injection of the virus, isolation and segregation is more practical for laboratory rabbits.

ORAL PAPILLOMATOSIS. An infectious disease of rabbits caused by an oncogenic virus usually in association with injury and characterized by benign papillomas occurring on the lower surfaces of the tongue and occasionally on the gums of the floor of the mouth.

CONTROL—Since the condition is relatively benign and since its distribution appears to be widespread, the possibilities of eliminating the condition are not easy or practical.

RABBIT POX. An infectious disease caused by a virus and characterized by nasal discharge, skin papules and pustules, high temperature and prostration.

CONTROL—Control is based upon isolation and segregation.

MYXOMATOSIS. An infectious contagious disease caused by an oncogenic virus and characterized by conjunctivitis, edema of the eyelids, nasal discharge, dyspnea, and by tumors which appear in the skin around the eyes, mouth, nose, and genitalia.

CONTROL—Control is based upon slaughter and quarantine. Vaccination has been used in some cases but is not practical for laboratory animals.

PASTEURELLOSIS. (Hemorrhagic septicemia, Snuffles). Pasteurellosis is a disease of rabbits caused by *Pasteurella lepisepticus* resulting in various sequella. The most acute form is a septicemia in which death occurs in 18 to 36 hours. Another severe form is a broncho-pneumonia leading to death in 24 to 48 hours. Besides these peracute types the variations that may take place are localized pleuropneumonia, purulent peritonitis, a purulent discharge from the nasal passage ("snuffles"), or a combination or progression of these forms.

CONTROL—Isolate new animals. If sick animals appear remove them to where they cannot infect the healthy animals.

SALMONELLOSIS (paratyphoid). Salmonellosis is a disease of rabbits caused by organisms belonging to the genus *Salmonella*. The species most often involved is *S. typhimurium*. The mortality is usually high during an outbreak.

CONTROL—Do not raise rabbits where they can be contaminated by Salmonella from other rodents or chickens.

RABBIT SYPHILIS. A venereal disease of rabbits, not transmissable to other animals or to man, caused by *Treponema cuniculi*. There is a long incubation period.

CONTROL—Unless it is known that the colony is free of this disease, the rabbits should be carefully examined before mating. Eliminate those with suspicious lesions.

TUBERCULOSIS. Tuberculosis of rabbits is a chronic disease caused by all three varieties of *Mycobacterium tuberculosis* that infect warm-blooded animals: human, bovine, and avian. In the United States bovine tuberculosis is a rare disease.

CONTROL —Do not allow rabbits to become contaminated by chickens that have the disease. Animal caretakers should be examined for tuberculous lesions that might contaminate the rabbits.

PSEUDO-TUBERCULOSIS. See pseudo-tuberculosis in guinea pigs.

EIMERIA PERFORANS. These coccidia are frequent parasites of the laboratory rabbits and develop within the epithelial cells of the small intestine. The disease runs into course from single exposure in about 15 days.

CONTROL—Same as for *E. steidae*.

EIMERIA STEIDAE. These coccidia are frequent parasites of the laboratory rabbit. The sporozoites reach the liver from the intestines by the portal radicules and the oocysts are returned to the intestines by way of the bile ducts, gall bladder and common bile duct. The endogenous cycle takes place in the epithelial cells of the bile ducts and the developmental cycle is completed in about three weeks.

CONTROL—Prevent contamination of the feed and water with sporulated oocysts and clean cages regularly.

LICE. The common louse of rabbits is *Haemodipsus ventricosus*, the sucking rabbit louse.

CONTROL—Application of rotenone will usually rid the animal of these parasites. Care must be taken to prevent reinfestation from contaminated cages or bedding or from contact with infested animals.

MITES. Rabbits are subject to attack by two types of mites: the ear mites, *Choraptes cuniculi* and *Psoroptes communis* var. *cuniculi*, and

the body mange mites, *Sarcoptes scabie*, var. *cuniculi* and *Notoedres minor* var. *cuniculi*.
CONTROL—The mites may be controlled by rotenone in mineral oil.

Diseases of the Monkey

LYMPHOCYTIC CHORIOMENINGITIS. Lymphocytic choriomeningitis is a disease caused by a filterable virus that has been reported in monkeys. It can be transmitted by the mosquito *Aedes aegyptis*.
CONTROL—Insect control.
B-VIRUS. B-virus may be latent in monkeys, as neutralizing anti-bodies are frequently demonstrated in monkeys. It has been transmitted to humans by the bite of a monkey.
TUBERCULOSIS. An infectious disease caused by *Mycobacterium tuberculosis* and characterized by coughing and progressive loss of weight and condition.
CONTROL—By isolating new animals and by the repeated tuberculin testing of all animals in the colony and of all animal personnel.
REFERENCE—Kennard, M. A., Schroeder, C. R., Trask, J. D., and Paul, J. R. A cutaneous test for tuberculosis in primates. *Science*, 89: 441–443 (1939).
GASTROENTERITIS. A primary or secondary condition caused by *Salmonella* or other coliform organisms, usually precipitated by other debilitating conditions or infections, dietary changes, or unhygienic practices, and characterized by nausea, vomiting, diarrhea, abdominal pains, anorexia, and fever.
CONTROL—This condition is controlled by strict sanitation and slaughtering or by isolating and treating infected animals with chemotherapeutic, antibiotic and supportive medicants.
PNEUMONIA. Inflammation of the lungs which usually occurs secondarily to other debilitating conditions and may be caused by various organisms. It is characterized by rapid onset, fever, anorexia, and respiratory distress.
CONTROL—This condition is controlled by preventing contact with new animals and by eliminating temperature fluctuations, drafts, and dampness. Treatment should include chemotherapeutic, antibiotic, and supportive therapy.
REFERENCE—Brumley, D. V. "Diseases of the Small Domestic Animals." Lea and Febiger (1943).
STRONGYLOIDES INTESTINALIS. This nematode is found in the small intestine, and in the parasite cycle only the females occur. The infective larvae may gain entrance to the body by contaminated feed or water or by penetrating the skin. The larvae enter the general circulation, break out of the alveoli of the lungs, pass up the trachea, and from there go on to the small intestines where they develop to mature worms.
CONTROL—Prevent contamination of the feed and water by infective larvae and remove feces from cages daily and take appropriate care in disposing of them.
OESOPHAGOSTOMUM APIOSTOMUM. A nematode whose mature larvae invade the wall of the cecum and after a period of development, break out of the nodules and migrate into the lumen where they develop into adult worms.
CONTROL—The administration of 1 gram of phenothiazine in the feed or in a capsule is an effective treatment. Contamination of the food and water with infective larvae should be prevented.
MITES. Monkeys may be infested with the monkey lung mite, *Pneumonyssus simicola*, which produces no visible external symptoms except that infestation with this mite is often mistaken for pneumonia in monkeys. There are nodular lesions of the lungs.
CONTROL—unknown.
REFERENCE—Medical entomology, Wm. B. Herms, 1950, pp. 545–6.

Diseases of the Dog

CANINE DISTEMPER. A highly contagious disease caused by a virus and characterized initially by high temperature, lassitude, and inappetence. The later symptoms depend upon secondary involvement and include conjunctivitis, rhinitis, ocular and nasal discharge, cough, dyspnea, pneumonia, vomiting, diarrhea, dehydration, emaciation, and in some cases nervous manifestations.
CONTROL—Control of Distemper consists of employing strict sanitation and hygienic practices, isolation of infected and exposed animals, and the use of vaccine and serum prophylactically.
REFERENCES: (1) La Croix, J. V. (Editor). "Canine Medicine". American Veterinary Publications, Inc. (1953). (2) Merchant, I. A. "An

Outline of the Infectious Diseases of Domestic Animals." Burgess Publishing Co. (1952).

INFECTIOUS CANINE HEPATITIS. Syn: *Fox Encephalitis*. A contagious disease caused by a virus and characterized initially by high temperature, lassitude, and inappetence. The later symptoms depend upon secondary involvement and may include tonsillar inflammation, abdominal tenderness in the regions of the liver, nasal and ocular discharge, dyspnea, pneumonia, vomiting, diarrhea, emaciation, corneal opacity, and in some cases nervous manifestation.

CONTROL—Control of Infectious Hepatitis consists of employing strict sanitation and hygienic practices, isolation of infected and exposed animals, and the use of vaccine and serum prophylactically.

REFERENCES— (1) La Croix, J. V. (Editor). "Canine Medicine". American Veterinary Publications, Inc. (1953). (2) Merchant, I. A. "An outline of the Infectious Diseases of Domestic Animals." Burgess Publishing Co. (1952).

RABIES. Syn: *Hydrophobia*. An infectious disease caused by a virus that has a specific affinity for nervous tissue and characterized by mental disturbance, vague changes in temperament, nervous excitability, anorexia, emaciation, paralysis, and death.

CONTROL—There is no proven treatment. The control of the disease is based upon the destruction of infected animals and the immunization of all others using either a killed tissue vaccine or an attenuated live virus.

REFERENCES— (1) Hagan, W. A., and Bruner, D. W. "The Infectious Diseases of Domestic Animals." The Comstock Company (1951). (2) Hull, T. G. "Diseases Transmitted from Animals to Man." Charles C Thomas (1947).

INFECTIOUS PAPILLOMATOSIS. A relatively benign infectious neoplastic disease caused by an oncogenic virus and characterized by the development of small pedunculated tumors on the skin or mucous membrane.

CONTROL—Surgical removal may be employed if the tumors interfere with normal functions; however, the tumors tend to shrink and disappear spontaneously.

REFERENCE—LaCroix, J. V. (Editor). "Canine Medicine." American Veterinary Publications, Inc. (1953).

PSEUDORABIES. Syn: Aujeszky's Disease. An infectious disease caused by a filterable virus and characterized by anorexia, intense local skin irritation, mental disturbance, pharyngeal paralysis, increased salivation, violence, convulsions, and death.

CONTROL—There is no known treatment. The disease is believed to be transmitted by the ingestion of parts of infected animals, usually rats. Control consists of ridding premises of wild rats.

REFERENCES— (1) Hagan, W. A., and Bruner, D. W. "The Infectious Diseases of Domestic Animals." The Comstock Company (1951). (2). Merchant, I. A. "An Outline of the Infectious Diseases of Domestic Animals." Burgess Publishing Company (1952).

LEPTOSPIROSIS. An infectious contagious disease caused by *Leptospira icterohemorrhagiae* and *Leptospira canicola* which may be characterized by mild chronic symptoms or by a sudden onset, inappetence, vomiting, diarrhea, dehydration, icterus, dark colored urine, nervous seizures, coma, and death.

CONTROL—The disease can be controlled by isolating or eliminating all animals voiding leptospirae in their urine. Infected animals can be successfully treated if given early treatment including antibiotics, immune serum and supportive therapy.

REFERENCE—Hoskins, H. P., La Croix, J. V., and Mayer, Karl (editors). "Canine Medicine." American Veterinary Publications, Inc. (1953).

GASTROENTERITIS. A primary or secondary condition caused by *Salmonella* or other coliform organisms, usually precipitated by other debilitating conditions or infections, dietary changes, or unhygienic practices, and characterized by nausea, vomiting, diarrhea, abdominal pains, anorexia, and fever.

CONTROL—This condition is controlled by strict sanitation and slaughtering or by isolating and treating infected animals with chemotherapeutic, antibiotic and supportive medicants.

REFERENCE—Brumley, D. V. "Diseases of the Small Domestic Animals." Lea and Febiger (1943).

SALMON POISONING. Syn: Salmon Disease. An infectious disease occurring in California, Oregon, and Washington caused by the ingestion of salmon and trout infected with the fluke *Troglotrema salmincola* which in turn carries the etiological rickettsia. The disease is characterized by fever, lassitude, anorexia,

ocular discharge, facial edema, vomiting, hemorrhagic diarrhea, and usually death.

CONTROL—The disease is controlled by preventing the ingestion of raw fish and by snail control.

REFERENCE—LaCroix, J. V. (Editor). "Canine Medicine." American Veterinary Publications, Inc. (1953).

PNEUMONIA. Inflammation of the lungs which usually occurs secondarily to other debilitating conditions and may be caused by various organisms. It is characterized by rapid onset, fever, anorexia, and respiratory distress.

CONTROL—This condition is controlled by preventing contact with new animals and by eliminating temperature fluctuations, drafts, and dampness. Treatment should include chemotherapeutic, antibiotic, and supportive therapy.

REFERENCE—Brumley, D. V. "Diseases of the Small Domestic Animals." Lea and Febiger (1943).

HISTOPLASMOSIS. This disease is caused by a fungus, *Histoplasma capsulatum*, which is found in soil. The main portal of entry into the animal is via the respiratory tract but occasional primary intestinal or possibly cutaneous infections may occur. The disease is apparently acquired from inhaled dust particles and does not seem to be transmitted in nature from animal to animal or to man. Cough, emaciation, anorexia, diarrhea, and vomiting are outstanding symptoms. The disease is more often chronic than acute but recovery is rare in symptomatic cases.

CONTROL—There is no known treatment for Histoplasmosis. It is desirable to keep the floors in the animal house where animals with histoplasmosis are kept, moist with antiseptic solution since disease is dustborne, and sawdust and other dusts from cages represent potentially infectious material.

REFERENCE—Canine Histoplasmosis. Jour. Am. Vet. Med. Assoc. 119: 411–415, 1951.

DERMATOMYCOSES. *Dermatomycoses*, commonly known as ringworm, are caused by several fungi which can be classified as follows: 1. *Epidermophyton*, *E. floccosum;* 2. *Microsporum*, *M. Audouini*, *M. canis*, *M. gypseum;* 3. *Trichophyton*, *T. gypseum*, *T. rubrum*, *T. rosaceum*, *T. faviforme*, and *T. crateriforme.* These fungi are, in general parasites of keratinized tissue and are invaders of hair, skin, nail, and allied structures, that may cause loss of hair with bald spots exhibiting broken off hair, crusted skin lesions, and kerion.

CONTROL—Dogs can be successfully treated by either manual or X-ray epilation and application of fungicides. Results depend on species of fungus, age and nutritional condition of the animal and the intensity of treatment and initial extension of lesion. Spontaneous recovery is possible with increasing age of animals. Care should be taken by diener to prevent his contracting the disease when handling infected animals.

ISOSPORA BIGEMINA. A protozoan which causes coccidiosis in dogs and cats. The developmental cycle takes place in the subepithelial and epithelial tissues of the small intestines of the dog and cat. Heavy infections of *Isospora bigemina* may produce diffuse hemorrhages of the mucosa and desquamation of epithelial cells.

CONTROL—Clean cages regularly and prevent contamination of the feed and water with sporulated oocysts.

ASCARIASIS. Dogs and cats are attacked by three ascarids, (*Toxocara canis*, *Toxascaris leonina*, and *Toxocara cati.*) *Toxocara canis* and *Toxocara cati* spend part of their developmental cycle migrating through the blood stream; they pass up the trachea via the lungs, and are swallowed to mature in the intestine. Pneumonia may develop from the migrations. The larvae of *Toxascaris leonina* enter the crypts of Lieberkuhn where they develop, then return to mature in the duodenum. They may block the bile and pancreatic ducts.

CONTROL—Contamination of food and water with infective ascaroid eggs should be prevented. Special treatment of runs is indicated to prevent these from becoming a source of infection.

ANCYLOSTOMA CANINUM. This is the common hookworm of dogs and cats and has a life cycle that is direct. Infection may be produced by three routes: (1) ingestion, (2) penetration of the skin, and (3) prenatal infection. These parasites mature in the small intestine and the life cycle is completed in 15–26 days in the dog and in 22–25 days in the cat. They cause numerous open lesions and bleeding areas in the small intestine. In heavy infestations these worms produce anemia.

CONTROL—Cages should be cleaned regularly

and feces disposed of to prevent exposure to infective larvae.

TRICHURIS VULPIS. The whipworm is found in the cecum and colon of dogs. Larvae penetrate the mucosa of the small intestines after infective eggs are eaten, and after a period of development they return to the lumen and pass to the cecum and colon where they reach maturity in 70 to 90 days. Heavy infestations cause colic and chronic enteritis and mucosa shows areas of thickening and inflammation.

CONTROL—Clean cages regularly and protect food and water from becoming contaminated with infective eggs.

CAPILLARIA AEROPHILA. This capillarid is found in the trachea and bronchi of dogs and cats. The life cycle is direct and after eggs are ingested, the larvae penetrate the mucosa of the small intestine, enter the blood system where they reach lungs and develop to maturity. Heavy infestations may cause bronchitis and bronchopneumonia.

CONTROL—Clean cages regularly and prevent the animal's food and water from becoming contaminated with infective lung worms eggs.

DIROFILARIA IMMITIS. *Dirofilaria immitis* is a filarid-worm that is primarily recovered from the right ventricle and pulmonary artery of the dog, cat, fox, and wolf. This disease is found principally in the southern states, but has been reported throughout the United States. The life cycle is indirect with a blood-sucking arthropod, dog flea, cat flea or mosquito as an intermediate host. Pathologic lesions are chronic endocarditis, dilatation of the right ventricle, congestion of the lungs, enlargement of the spleen, and ascites.

CONTROL—Prevent dogs and cats from being bitten by ectoparasites and mosquitoes and take precaution to prevent infection of mosquitoes or fleas by infected animals, thus allowing completion of life cycle.

TAPEWORMS. *Dipylidium caninum*, *taenia taeniaeformis*, and *taenia pisiformis* are tapeworms that infest the dog and cat. *D. caninum* has a life cycle that requires a flea or a louse as an intermediate host. *T. taeniaeformis* and *T. pisiformis* have life cycles that require rodents (rats, mice, squirrels, and rabbits) as intermediate hosts. *D. caninum* may infest man.

CONTROL—The quarters should be kept free of uncaged rodents. The animals should be kept free of ectoparasites. The diener should take care in handling the animals that he should not become infested.

LICE. Dogs are liable to infestation by two species of lice: *Linognathus piliferus*, the dog sucking louse and *Trichodectes canis*, the dog biting louse. These cause restlessness, digging and scratching and loss of condition.

CONTROL—Application of lindane, rotenone, or DDT will usually serve to rid the animal of these pests but care must be taken to prevent reinfestation from contaminated bedding or cage or from contact with infested animals.

REFERENCES—(1) Medical Entomology, Wm. B. Herms, 1950, p. 41. (2) Insect Control by Chemicals, A. W. A. Brown, 1951, pp. 680–1.

MITES. Three types of mites are commonly found on dogs: *Sarcoptes scabiei canis*, Sarcoptic mange, *Demodex canis*, Demodectic (red) mange, and *Otodectes cynotis*, ear mange. The skin thickens and becomes scaly and hair falls out, the animal will usually itch and scratch. With ear mange the animal will shake its head scratch ears, and run in circles.

CONTROL—Lime-sulfur dip, 1% rotenone, 20% benzyl benzoate in ointment, or lindane in vegetable oil will usually serve to rid the animal of these parasites. Care should be taken to rid cages and bedding of parasites and prevent contact with infested animals as reinfestation will occur.

REFERENCES—(1) Keeping Livestock Healthy, USDA 1942, pp. 1174–7. (2) Veterinary Helminthology & Entomology, Monnig, 1947, pp. 382–6.

DERMACENTOR VARIABILIS. This tick, the American dog tick, prefers the dog as a host but will live on man, cattle, horses, hogs, cats, rabbits and many other domestic and wild animals. The larvae and nymphs feed almost exclusively on meadow mice and other small rodents. Infestations are usually associated with an abundance of grassy cover. The ticks may cause irritation with secondary infection of the tick bite wounds, anemia, restlessness, and irritability, and paralysis.

CONTROL—Elimination of grassy areas, and of the small rodents that serve as intermediate hosts, will control these ticks. Heavy residual application of 5% DDT where ticks invade houses and outbuildings has given control.

RHIPICEPHALUS SANGUINEUS. The

tick, the brown dog tick, may become a serious pest if allowed to establish itself in buildings and propagate there. Although the dog is the principal host, it is reported to attack many other animals. The adult ticks are most often found in the ears and between the toes of dogs, while the larvae and nymphs are found in the long hair at the back of the neck. Eggs are deposited in cracks and crevices of living quarters. Malignant jaundice (*canine babesiasis*) is transmitted to the dog by the bite of the adult tick.

CONTROL—Same as for American dog tick.

FLEAS. Dogs are susceptible to infestation by several species of flea. These are: *Pulex irritans*, the human flea, *Ctenocephalides canis*, the dog flea, *Ctenocephalides felis*, the cat flea, *Echidnophaga gallinacea*, the sticktight flea. Restlessness, biting and scratching are the most common symptoms of infestation with these parasites.

CONTROL—To rid the animal of these parasites one can use DDT, nicotine sulfate, rotenone, pyrethrins, or benzene hexachloride dust. Care must be taken to rid bedding and cages of the fleas and prevent reinfestation; also contact of infested dogs with bedding, cages, or non-infested animals must be prevented.

REFERENCES—(1) Keeping Livestock Healthy, USDA 1942, pp. 1188–92. (2) Veterinary Helminthology & Entomology, Monnig, 1947, pp. 356–8. (3) Insect Control by Chemicals, A. W. A. Brown, 1951, p. 686.

Diseases of the Cat

INFECTIOUS PANLEUKOPENIA. Syn: Feline Distemper; Feline Enteritis; Infectious Feline Agranulocytosis. A highly contagious, highly fatal disease caused by a filterable virus and characterized by sudden onset, high temperature, leukopenia, dehydration, anorexia, vomiting, weakness, depression, diarrhea, and usually death.

CONTROL—Immunization is widely practiced employing either killed tissue vaccine or the specific antiserum. Infected animals should be destroyed, or at least completely isolated away from all susceptible animals. Treatment consisting of specific antiserum and broad spectrum antibiotics is only effective in the early stages.

REFERENCE—Riser, W. H. Infectious panleukopenia of cats. North Amer. Vet., 24: 293–299 (1943).

FELINE PNEUMONITIS. Syn: Feline Infectious Coryza. A highly contagious debilitating disease caused by a psittacosis-lymphogranuloma virus and characterized by purulent conjunctivitis, nasal discharge, sneezing, coughing, and extensive loss of weight.

CONTROL—The value of vaccination for this disease is still doubtful. Sick animals should be isolated and given symptomatic and palliative treatment plus broad spectrum antibiotics, or be destroyed.

REFERENCE—Hamre, D., and Rake, G., Feline pneumonitis (Baker), a new member of the lymphogranuloma-psittacosis group of agents. *J. Infect. Dis.*, 74: 206–211 (1944).

FELINE VIRAL PNEUMONIA. A highly fatal disease caused by a filterable virus and characterized by purulent conjunctivitis, rhinitis, sneezing, and coughing.

CONTROL—All infected animals should be immediately isolated or destroyed.

REFERENCE—Blake, F. G., Howard, M. E., and Tatlock, H. Feline virus pneumonia and its possible relation to some cases of primary atypical penumonia in man. *Yale Jour. Biol. and Med.*, 15: 140–145 (1942).

RABIES. See Rabies of the Dog.

PSEUDORABIES. See Pseudorabies of the Dog.

PNEUMONIA. See Pneumonia of the Dog.

GASTROENTERITIS. See Gastroenteritis of the Dog.

DERMATOMYCOSES. See Dermatomycoses of the Dog.

CONTROL—Cats are difficult to treat and in many countries, destruction of infected animals is required by law.

ASCARIASIS. See Ascariasis of the Dog.

ANCYLOSTOMA CANINUM. See *Ancylostoma caninum* of the Dog.

DIROFILARIA IMMITIS. See *Dirofilaria immitis* of the Dog.

CAPILLARIA AEROPHILA. See *Capillaria aerophila* of the Dog.

TAPEWORMS. See Tapeworms of the Dog.

ISOPORA BIGEMINA. See *Isospora bigemina* of the Dog.

FLEAS. Cats are susceptible to infestation by three species of flea: *Pulex irritans*, the human flea, *Ctenocephalides canis*, the dog flea, and *Ctenocephalides felis*, the cat flea. Biting and

scratching are common symptoms; with heavy infestations there is restlessness and loss of condition. It is also quite common to find the parasite on the animals.

CONTROL—The best control can be achieved by the use of rotenone or pyrethrins. Care should be taken to prevent spread from animal to animal. Never use any preparation containing DDT on cats.

REFERENCE—Insect Control by Chemicals, A. W. A. Brown, 1951, pp. 685–6.

THE CAT LOUSE. *Felicola subrostratus*. The cat louse, is a common parasite of cats, causing biting and scratching. In severe infestations one finds restlessness and loss of condition and the animal may become weak and anemic.

CONTROL—The best methods of control are the use of rotenone and of pyrethrins. Care should be taken to prevent spread and reinfestation.

REFERENCE—Medical Entomology, W. B. Herms, 1950, p. 139.

MITES. Cats are subject to infestation with both the mange mite, *Notoedres minor* var. *cati*, and the ear mite, *Otodectes synotis*. Cats infested with these parasites show restlessness and loss of condition. Fits often occur and it can be seen that the hair falls out and the skin is crusted.

CONTROL—These parasites can be controlled by application of sulfur ointment or of rotenone wash. Care should be taken to prevent spread of these parasites to noninfested animals and to prevent reinfestation from contact with infected animals after treatment.

REFERENCE—Insect Control by Chemicals, A. W. A. Brown, 1951, p. 670.

Diseases of the Frog

RED LEG DISEASE. Syn: Frog Septicemia. A highly infectious disease of frogs caused by *Pseudomonas hydrophila* and characterized by the fading of the skin from green to greenish-yellow, cutaneous red spots of the legs and eventually the abdomen, and flaccid muscles.

CONTROL—On receiving frogs they should be rinsed in running, clean cold water, or be allowed to swim in a weak solution of potassium permanganate for a brief period, and quickly removed. They should then be examined for cutaneous hemorrhages, a decrease in pigmentation, and for general listlessness, prior to being placed in storage. Affected frogs should be separated for treatment or discard. The tanks should be disinfected thoroughly after each lot of frogs is used. In warm climates it may be wise to store frogs in a refrigerator, washing them with cold water twice a week.

REFERENCE—Kaplan, H. M. The care and diseases of the frog. Proceedings of the Fourth Annual Animal Care Panel. December 2–3, 1953, Chicago (in press).

TABLE 1

TABLE I—SOURCES OF ANIMAL SUPPLY

Abbreviations and Explanations

Labs.—laboratories; transpl.—transplants; expts.—experiments; vit.—vitamin; vet.—veterinarian; approx.—approximately; coeff. inb.—coefficient of inbreeding; cmpds.—compounds; preg.—pregnant; out. br.—outbred; fert.—fertility; inb.—inbred; no.—number; res.—research; prod.—production.

Production per month, week, or year expressed in thousands, thus 20 represents 20,000, etc.

A. Mouse News Letter, Number 9, July, 1953—Laboratory Animals Bureau, London. B. Cancer Research 12(8)—602-613. 1952.

Blank spaces in this table indicate that information was not available.

Inb. may not necessarily indicate brother × sister mating unless so specified, or unless F preceding the number is used.

As of fall, 1953 under rations used indicates the ration in use when most of the data was obtained.

Numbers in parenthesis in description and uses column refer to references in bibliography of uses of animal stocks.

Statements in this table as to strain names, breeding, description of stocks, and uses and susceptibilities are the declarations of suppliers, and have not been confirmed in any way.

Table 1A—Mice

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Armer Enterprises, Croton Falls, New York							
Swiss-Webster JDA	Columbia Univ.	F 11 at Armer, 100 plus previously	Albino	Rockland Rat Diet	Tested for Salmonella		10–12/mo. Can double or triple
JDT		Selectively bred	Albino			High incidence spontaneous tumors	
Robert F. Beyer and Son, Billings, Missouri							
Swiss		Introduces new breeding stock frequently	Albino	Specially mixed diet and Purina Lab. Chow			2/wk. Can expand
Bio-Lab Breeding Institute and Albino Farms, P. O. Box 597, Bainbridge, New York							
Webster	Borden Res. Div.			Camps Small Stock Diet			12/mo. Can expand
Budd Mt. Rodent Farm,* Chester, New Jersey							
Hoover-Webster	Hoover	Inb. 5 yr. at Budd Mt. Previous unknown		Wayne Mouse Blocks	Tested for Salmonella	Tuberculosis experimentation	1/wk. Can expand

* Mice raised on separate farm under Budd Mt. supervision.

University of California, Cancer Research Genetics Laboratory, Berkeley, California							
A/He	Heston 1950	F 8 at UC, previous F84	See Cancer Research 12 (8); 602–13, 1952				1–1.5/mo.
C3H/He	Heston 1950	F 9 at UC, previous F20					
C57 BL	Jackson Lab. 1936	F 31 at UC, previous ?					
A	Jackson Lab. 1936	F 30 at UC, previous ?					Maintained for own use
C3H	Jackson Lab. 1936	F 38 at UC, previous ?					
BALB/c	Nat. Can. Inst. 1951	F 2 at UC, previous F 60					
University of California Medical Center, San Francisco, California							
Swiss-Webster	Rockefeller Foundation	F 21 at UC, previous ?		Rockefeller special formula, Purina dog chow, oats, greens	Facilities for disease control	Possess special susceptibilities for special research	Limited nos. from excess of own needs available
Princeton	Princeton	F 9 at UC, previous ?					
Carworth Farms, Inc., New City, Rockland County, New York							
AKR	See Cancer Res. 12 (8): 602–13, 1952 See Jour. Heredity 39 (10): 300–306, 1948			Wayne Lab. Blox for mice	Bacteriological and parasitic control		.6/wk.
CFW							15/wk.
CFCW							
CF1							13/wk.
Diablo Animals Labs., 290 Livorna Hgts. Rd., Walnut Creek, California							
ABC	Inst. Exp. Biol. Univ. of Calif.	18 gen. at Diablo, approx. 100 previous. See Cancer Res. 12(8): 602–13, 1952	Albino	Purina Lab. Chow plus supplement recommended by Cancer Genetics Res. Inst.		Widely used in research and clinical work	2/mo. Can expand

TABLE 1A—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Echelbarger Mousery, Box 151, Zionsville, Indiana							
Swiss	Rockland	Inb. 20 gen. at Echelbarger. Previous ?	Albino	Rockland Mouse Diet	Disease control facilities. Salmonella tested	General biological test work, rabies, influenza and typhus vaccine work. Good immune response to an antigen; susceptible to viruses and pathogenic bacteria	1/wk. Can expand
Gopher State Caviary, 862 Atlantic Street, St. Paul 6, Minnesota							
Swiss		Not inb. Frequent introduction of new breeding stock	Albino	Purina Fox checkers			5/yr. Can expand
W. W. Griggs, 296 S. 31st Street, San Jose 27, California							
Webster Cowan, D. M. C. NIH	Calif. Health Dept. Calif. Med. Center Cutter Labs. NIH	Inb. 14 yrs. at Griggs Previous inb. unknown		Commercial Dog Chow	Wash cages	High incidence of cancer. Psittacosis work	Can expand
Harlan Small Animal Industry, Cumberland, Indiana							
Swiss				Have own special formula	Tested monthly for Salmonella		Available at 5-30 gm. wt. Preg. females
Hemlock Hollow Farm, Black Oak Ridge Rd., Paterson, R. D. 4, N. J.							
Swiss (Webster)	Slanetz Columbia	Inb. 30 gen. Previous inb. unknown		Rockland "D Free" Rat Diet	Tested regularly for Salmonella		4/mo. Can double production

Hilltop Caviary, Box 195, Scottdale, Penna.						
Distributor for other breeders		Albino				
Iowa State College, Dept. of Genetics, Ames, Iowa						
BALB/Gw E LGW RI S Z	See Cancer Res. 12(8): 602–13, 1952 Mouse News Letter No. 9, July, 1953					
Roscoe B. Jackson, Memorial Laboratories, Bar Harbor, Maine						
	See Cancer Res. 12(8): 602–13, 1952; Mouse News Letter No. 9, July, 1953; Jackson Lab. File of Mouse Strains					
Manor Farms, Staatsburg, New York						
MF1		Inb. since 1943	Albino			
National Institutes of Health, Laboratory Aids Branch, Bethesda 14, Maryland						
A/HeN	See ref. A, B	Inb. F 90	Mammary tumor 40–50% in breeding females, lung tumor 50% at 12 mos., 90% at 18 mos., 100% nephritis at 15 mos.	Purina Lab. Chow	Regularly checked for diseases and parasites by a veterinarian	Cancer-tissue transplantation, irradiation	Breeding stock frequently
A/LN	See A, B	F 88	Mammary tumor 20% (74)			Susc. to rabies fixed virus and Lansing strain polio virus (75), young animals susc. to Andrew's mouse hepatitis virus (76) susc. to toxoplasmosis infection (77), cancer-tissue transplantation, infectious disease, nutrition	

TABLE 1A—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
National Institutes of Health, Laboratory Aids Branch, Bethesda 14, Maryland—Continued							
BALB/cAnN	See, A, B	F 76	Low mammary tumor, but high when milk agent is introduced (78)			Susc. chronic pneumonia in older animals, susc. to Toxoplasmosis infection (77), Cancer-tissue transplantation; infectious disease, biochem. studies; pharmacol. studies	
	—						
BL/HeN	See A, B	F 48	Mammary tumors 26% in breeding females, 4% in virgins over 6 mos., lung tumor 37% in old animals				
BLCP/N	See A, B	Inb.					
BRSUNT/N	See A, B	F 40	Spontaneous adenomatist hyperplasia on lesser curvature of stomach at pylorus (10%) in animals, 10–15 mo., obesity in animals over 6 mos.				
C3H/HeN	See A, B	F 28	Mammary tumor (100%) in breeding and virgin females, many hepatomas			Susc. rabies fixed virus and Lansing strain polio virus (75), susc. infantile diarrhea in suckling young; spontaneous mammary tumors and milk factor, tissue transplant, nutrition; infectious diseases	
$C3H_fB/HeN$	See A, B	F 19	Mammary tumor 38% in breeding females at 20 mos. 2% in virgin females at 22 mos.			Mammary tumors and milk factors; tissue transplants; nutrition, infectious diseases	
C57BL/6JN	See A, B	F 35	Mammary tumor very low in breeding females, absent in virgins, other internal tumors, lymphosarcomas; eye abnormalities and hydrocephalus infrequent			Cancer-tissue transplantation; nutrition; infecfectious diseases	

C57BR/cdJN	See A, B	F 77	Low mammary tumor, eosinophil level sensitive to adrenotropic cmpds. (79)			Cancer tissue transplantation and hormonal studies; hormone assay	
C57L/HeN	See A, B	F 55	Low mammary tumors, considerable sterility in breeding age males			Cancer-tissue transplantation and hormonal studies	
C 58/LwN	See A, B	F 90	High leukemia			Cancer-leukemia studies	
DBA/2JN	See A, B	F 38+	High mammary tumor in breeding females, medium in virgins, 30–40% leukemia			Resis. to DBA/1 transplantable tumors. Cancer-tissue transplantation, leukemia studies; infectious diseases; nutrition	
STR/N	See A, B	F 31	Spontaneous adenomatist hyperplasia on lesser curvature of stomach at pylorus (10% at 12–15 mos.) obesity in animals over 6 mos.				
SWR/HeN	See A, B	F 46	44% lung tumor, 19% mammary tumor in breeding females				
1194/HeN	See A, B	F 55	Low lung and mammary tumor				
C57BL/10ScBsN	See B		Differs from C57BL/6 in incidence of eye defects				

Pennsylvania State University, State College, Pennsylvania

1	Purchased from animal dealer	Inb. and Outb.	Albino, susceptible to audiogenic seizures			100% sus. (15–50 days) to clonic-tonic seizures, but not dying	Small numbers breeders available
2						Similar sus. but having clonic seizures	
3						Low sus. (0–10% seizures, with many individuals not sus. at all)	
4						Sus. from 17 to 27 days. Not sus. after 27 days	

TABLE 1A—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Rawley Farms, 20268 Huntington Avenue, Detroit 24, Michigan							
Swiss (Webster)	Pitman-Moore	Inb. 20 years	Albino, sturdy	Purina Lab. Chow	Facilities for disease control	Highly sus. to virus research	8–10/mo.
NIH	NIH, 1950	Inb. 3 yrs.	Albino				8–10/mo. Can expand
Research Supply Co., 2436 W. York Street, Philadelphia 32, Penna.							
Hygienic		Inb. 15 yrs.	Albino			General purpose	All sizes of both sexes. Can expand
Rockland Farms, New City, Rockland County, New York							
RAP	Genetic background unknown prior to 1931		Albino	Rockland Mouse Diet	Ectromelia free. Periodic fecal examination for Salmonella, S. incidence under 2%	See listing and bibliography, pp. 53 and 57–59	50/mo. total all strains
SW (Swiss)	Webster (Rockefeller Inst.)		Albino				
DBAL	Bagg (Memorial Hosp. N. Y-C.)		Leaden				
DBAT	Bagg (Memorial Hosp. N. Y.)		Tan				
DBAW	Rockland origin		White				
C-57	Bagg (Memorial Hosp. N. Y. C.)		Black				
C-57	Bagg (Memorial Hosp. N. Y. C.)		Brown				
C3H	Slanetz (Columbia Univ.)		Agouti				

Royalhart Lab. Animals, New Hampton, New York

Swiss-Hoover Royalhart	Hoover strain	Inb. since 1950		Wayne Lab. Blox F	Facilities for disease control. Salmonella tested		2/mo. Can expand 50%

Shalom Research Farms, R. D. 4, Mars, Penna.

CFW	Carworth	Inb. F 8 at Shalom		Allied Mills Lab. Blox for Mice	Facilities available. Salmonella tested	Sus. to neurotropic viruses	20/mo. Can double production

Simonsen Laboratories, Day Road, Gilroy, California

A Swiss-Webster	AEC Radiation Lab. Berkeley Jackson Lab.	Inb. F 10. F 16 previously		Inst. Exp. Biol. Diets 1 and 14	Facilities available. Salmonella tested	General purpose, radiation Poliomyelitis, encephalitis and allied viral studies. General bacteriological and serological work	6/mo. Can expand

E. G. Steinhilber, 2 Josslyn Avenue, Oshkosh, Wisconsin

Collects mice from other producers							

Joseph E. Stocker, 44 N. Central Avenue, Ramsey, New Jersey

Swiss × Rockland Webster	Rockland Farms (Animals are raised by other breeders)	Random bred	Albino Albino	Rockland Mouse Diet	Tested periodically for Salmonella		In sizes from 8 gm. up 1–1.5 wk. Can expand

Stockely-Peterson, Route 4, P. O. Box 1254, Madison, Wisconsin

RAP Swiss-Webster	Rockland				Produced under sterile conditions		Various age groups and pregnant females

TABLE IA—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Arthur Sutter, 1813 W. Phelps Street, Springfield, Missouri							
Swiss (Webster)	Rockland	Closed colony		Rockland Mouse Diet	Salmonella tested		8/mo.
Taconic Farms, Inc., Germantown, New York							
Taconic	Rockefeller Inst. 1937	Outbr.		Standard Lab. diet supplemented with whole oats 3 times a week	All breeding stock vaccinated for Salmonella. Colonies checked periodically	More sus. to nitrofuran compound than other Swiss mice More resistant to S. typhosa infection than Swiss mice previously used	10–12/wk. Can expand
W. I. (both Swiss-Webster stock)	Carworth CFW	Inb. F 20 at Taconic Approx. 200 at Carworth					
Tumblebrook Farm, Brant Lake, New York							
Swiss (Webster)	Lynch	96 plus 20	See Cancer Res. 12 (8): 602–13, 1952		Rigorous sanitation and good management practices are employed	Sus. to virus infections	* 25/wk. Can expand
A	Strong	18 plus 87				High mammary and lung tumors	
AKR	Jackson Lab.	12 plus 31				High leukemia	
BALB/c	Jackson Lab.	10 plus 51				High mammary tumor with milk agent	
C 57 BL	Heston	20 plus 41				Low tumor incidence	
C 57 BL/6	Jackson Lab.	10 plus 32				Low tumor incidence	
dba	Heston	32 plus 58				High mammary tumor, leukemia 35–40%	
C3H	Heston	20 plus 58				High mammary tumor and liver tumor	
LW	Gooddale	16 plus 44				Weight 2½ times ordinary albino	
Pink	Tumblebrook	22				Sus. to bacterial infections	
GFF	Bacharach	12 plus 16				Sus. to chemical toxins	
rr	Danforth	8 plus 26				Choreic behavior	
ch	Danforth	8 plus 40				No tumors ever observed	
hr	Tumblebrook	19				Skin cancer and allergy tests	

WF	Webster	84 plus 20				Extreme virus susceptibility	
DP	Tumblebrook	18				Sus. to anemia	
PRI	Sabin	5 plus 32				Resistant to certain virus infections	
Woodside Meadows, RD 2, Littlestown, Pennsylvania							
Procured from various producers							

* Orders for special strains can be filled on notice.

TABLE 1B—Rats

Robert F. Beyer and Sons, Billings, Missouri

		Introduces new breeding stock at intervals	Albino	Own special mixed diet and Purina Lab. Chows			.3/wk. Can expand
Bio-Lab. Breeding Inst. and Albino Farms, P. O. Box 597, Bainbridge, New York							
Wistar	Borden Res. Div.	Closed colony inb.		Camps Small Stock Diet			8/mo. Can expand
Budd Mt. Rodent Farm, Chester, New Jersey							
Wistar	Wistar Inst.	Inb. 8 yrs. at Budd Mt.		Wayne Rat Blocks	Access to two labs. and a doctor director. Salmonella tested	90% sus. to sarcoma transpl., suited for hormone work, fail in work requiring quick physical breakdown	1/wk. Can expand
University of California, Dept. of Animal Husbandry, Davis, California							
Line 30/UCAH	Long-Evans	F 20 at Calif; none previously	Mature weight 375 grams	McCollum Diet 1 (25 years)		Developed to reduced variance in physiological expts.	

TABLE 1B—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Carworth Farms, Inc., New City, Rockland County, New York							
CF (Wistar)	Hinsey (Cornell) Wistar	Pen inb., previous ?	Medium size, very gentle	Wayne Lab. Blox R	Checked bacteriologically and for parasites. Eliminating bartonellosis	Low incidence of bartonellosis and spontaneous mammary tumors; no known vitamin deficiencies	3/wk. all sizes to 150 gm. virgin females; preg. F. on 30 da. notice. Dated litters at 3 wks. age
Charles River Breeding Labs., Inc., 1093 Beacon Street, Brookline 46, Massachusetts							
CR	Wistar and Sprague-Dawley	Within colony outbred	Docile, rapid growth, vigorous, high fertility	Own mixture in pellet form	Routine fecal culture by Slanetz method to screen Salmonella carriers; under vet. supervision at all times	High res. to respiratory infections. Suited to endocrinectomies. This and other surgery performed on premises by trained technicians	3/wk. varying wt. and sex; preg. females; litter mates. Can expand 30%
Diablo Animal Laboratories, 290 Livorna Hgts. Rd., Walnut Creek, California							
Long-Evans	Inst. Exp. Biol. Univ. of Calif.	F. 18 gen. at Diablo. Approx. 100 previously	Hooded, multi-colored, hardy	Purina Lab. Chow plus supplements by Cancer Res. Inst.	Isolation quarters	Endocrine and nutritional studies	1.5/mo.
Sprague-Dawley	Sprague-Dawley		Albino, hardy			Radiology, bio-assay, cancer research	1/mo. varying wt. and sex. preg. females
Fountain City Fur Farm, 220 Garden Avenue, Fountain City, Tenn.							
Wistar	1952, Laboratory Animals Farm, New Jersey	Closed colony	Albino	Variety of cooked food and green vegetables			.2/mo. Can expand

Funny Farms (Hulmac Labs.), Middletown Springs, Vermont							
Sherman McKinney	Columbia Univ. Developed at Hulmac	3 to 1 system; separated when preg.	White Black hooded	Eastern States Feeds	Checked for diseases		.5/wk. Can expand
Harlan Small Animal Industry, Cumberland, Indiana							
			Male and Female albino, individual litter records kept, litters reduced to 7	Own special formula	Tested monthly for Salmonella	"D" free for vitamin assay, general testing work	
Hemlock Hollow Farm, Black Oak Ridge Road, Paterson, New Jersey							
Osborne-Mendel (Sherman)	Columbia Univ. (Slanetz)	Inb. F 30. Previous ?	Albino	Rockland "D Free" Rat Diet	Regularly tested for Salmonella		8/mo. Males and Females of varying wt. classes
Holtzman Rat Company, Rt. 4, Badger Lane, Madison 5, Wisconsin							
Sprague-Dawley Holtzman	Sprague-Dawley	Within strain breeding	Albino	Own mixture of natural foods without vitamins or antibiotics added	Sanitary provisions against disease	High resistance to respiratory infections	20/mo.
Illinois Institute of Technology, Physiological Dept., Chicago 16, Illinois (Dr. P. S. Shurrager)							
			"Naked" (bald rats)			High percentage develop glaucoma; useful for studies of glaucoma, skin characters, genetics	Small surplus at irregular intervals
Maguran Farms, 3266 Rochester Rd., Birmingham, Michigan							
Yale	Maynard (Cornell)	Inb. since 1927; 15 yrs. at Maguran	Albino	Own formula, no antibiotic supplement		Estrogen assay, thyroid research. High survival following surgery, low storage of vitamins and minerals; sus. to artificially produced tuberculosis which localizes in the lungs	1.5/wk. Can double production

Table 1B—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Manor Farms, Staatsburg, New York							
MS-2 (Sherman)		Inb- since 1943, previous breeding history unknown	Albino	Manor Farms Small Stock Diet (pelleted)	Means available for disease control. Salmonella tested		25/yr. either sex of varying wt. classes. Can expand
Note: Bred for special requirements as spontaneous tumor, pregnant, special diets, etc.							
National Institutes of Health, Laboratory Aids Branch, Bethesda 14, Maryland							
A × C 9935 (Irish)	Dunning 1926, to Heston 1945 at F 30, to N 1950 at F 41	Inb. F 46	Ave. life span 21.7 mo.; high spontaneous tumors of neck and uterus; high kidney abnormalities (cystic to unilateral or bilateral absence); high uterus and ovary abnormalities. Black agouti	Purina Lab. Chow	Regularly checked for diseases and parasites by a veterinarian	Partially resistant to Cysticercus; medium resistance to Bartonella infection. Cancer-transplanted tumor work	Breeding stock frequently available
Buffalo	Heston 1946 from Buffalo stock of Morris, to N 1950 at F 10	F 16	Albino			Cancer-hormonal imbalance studies; dental caies studies	
Fischer 344	Dunning 1920, to Heston 1949 at F 49, to N 1950 at F 51	F 56	Albino, non-agouti, hooded. Ave. life span 12.3 mo.; high fertility; positive JRS 1548; fairly high dental caries			Cancer-transplanted tumor studies, dental caries studies. Susceptible to Cysticercus	
M-520	Dunning 1920, to Heston 1945 at F 41, to N 1950 at F 53	F 59	Albino, non-agouti, hooded. Ave. life span 13.5 mo., high fertility, spontaneous tumors rate 100% positive to J. R. S.			Cancer-transplanted-tissue studies; dental caries; susceptible to Cysticercus, medium suscept. to Bartonella	
O-M	Heston 1946 from non-inb. Osborne-Mendel stock of J. White, to N 1950 at F 9	F 15	Albino			Cancer-carcinogen-studies; dental caries. Very suscept. to Bartonella	

Wistar	Heston 1943 from non-inbred Wistar (Carworth) stock of Nettleship, to N 1950 at F 14	F 18	Albino			Cancer-transplanted-tumor work; dental caries	
O'Grady	O'Grady to Heston 1948 to N 1950 at F 32	F 36	Albino			Completely resistant to Bartonella	
Pacific Animal Farms, 2457 Fletcher Drive, Los Angeles 39, California							
Long-Evans	H. M. Evans	12 gen. at PAF., previously since 1923		Purina Lab. Chow. Lettuce twice weekly		Res. to stress of hypophysectomy, very res. to cold stress	4/mo. Can expand
Wistar	Carworth	12 gen at PAF. Inb. at Wistar since 1910					
University of Pittsburg, School of Dentistry, Pittsburg 13, Penna.							
Mead-Johnson Long-Evans						Dental caries, growth, nutrition	Few available
Research Supply Co., 2436 West York St., Philadelphia 32, Penna.							
Wistar		Inb. 15 yrs.	Albino			General purpose uses	All sizes of both sexes available Can expand
Rockland Farms, New City, Rockland County, New York							
Sherman Long-Evans	Columbia Univ. Rockefeller Inst.		Albino Hooded	Rockland Rat Diet "D Free"	Periodic fecal examination for Salmonella	See listing and bibliography pp. 53 and 57–59. Particularly suited for A and D assay. Also nutritional, physiological, endocrine and allied studies	8/mo.

TABLE 1B—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
Dan Rolfsmeyer, Syene Road, Madison 5, Wisconsin							
Sprague-Dawley	Sprague-Dawley	Inb. 3 gen. from Sprague-Dawley	Albino	Own mixture	Sanitary measures observed		10/mo. Can expand
Royalhart Lab. Animals, New Hampton, New York							
Royalhart (Wistar)	Navy Hospital, Bethesda	Inb. since 1947		Wayne Lab. Blox R	Facilities for disease control. Salmonella tested		8/mo. Can expand 50%
Simonsen Laboratories, Day Road, Gilroy, California							
Long-Evans	Rockefeller Foundation, Univ. of Calif., Berkeley	Maintained without sibling or parental breeding		Inst. Exp. Biol. Diets 1 and 14	Facilities for disease control. Salmonella tested	ACTH, gonadotropin and allied hormone assays. Excellent for thyroid expt. and surgical work, widely hypophysectomized	1.6/mo. Rats of other strains inbred and raised to order. Can expand
Sprague-Dawley, Inc., P. O. Box 2071, Fitchburg Road, Madison 5, Wisconsin							
Sprague-Dawley	Developed by Robt. Dawley, 1925	Closed colony selection	Albino	Sprague-Dawley formula, drugs and medicines not used	Maintain disease control measures. Raised under quarantine	Vitamin A and B storage held at minimum	65/mo.
E. G. Steinhilber and Company, 2 Josslyn Avenue, Oshkosh, Wisconsin							
	Produced by various breeders						

Joseph E. Stocker, 44 N. Central Avenue, Ramsey, New Jersey							
Wistar	Produced by various breeders	Albino. (Note: Strains other than Wistar available if specified)					Various wts. & ages available 15 gm. up. Can expand
Tumblebrook Farms, Brant Lake, New York							
Wistar Fischer			Albino	Rigorous sanitation and good management practices are employed			.5 to 2/wk.
Wistar Institute, 36th and Woodland Avenue, Philadelphia 4, Penna.							
Wistar	Developed by Wistar 1905	Closely bred, not inb.	Albino	Purina Dog Chow	Facilities for disease control		2.5 males 21 days to 3 mos.
Mutants		Closely bred	Blue Albino Chocolate Tawney Chocolate-shaggy Waltz-whirlers Cinnamon White-shaggy Curly Wild-grey Fawn Yellow (black-eye) Fawn-spotted white Yellow (red-eye)				Limited number order 2 or 3 mos. in advance
Inbred		Inb. 150 gen.				Cancer research	Limited no. for special work
Woodside Meadows, Littlestown, R. D. 2, Penna.							
	Procured from other sources						
Endocrine Laboratories of Madison, Inc., P. O. Box 228, 5001 W. Beltline Hgwy., Madison 5, Wisconsin							
			Endocrinectomized or prepared otherwise according to specifications				

TABLE 1C—GUINEA PIGS

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCE	PRODUCTION
Albino Cavies, 4932 Clara Street, Bell, California							
	Wallace Stock × Foreign Stock Some supplied by other breeders	Random bred. New breeding stock introduced yearly		16% protein rabbit pellets, oat hay, straw, vegetables	Disinfection, removal of diseased animals	General purpose	1/mo. Can expand
Carworth Farms, Inc., New City, Rockland County, New York							
Connaught	Zinnser, Harvard University	Inb. F 15	High production due to hereditary twinning	Wayne Rabbit Food	Bacteriological and parasitic control	Sus. to Shwartzman phenomena	.1/wk. can expand 100%
Gopher State Caviary, 862 Atlantic Street, St. Paul 6, Minnesota							
		Random bred. New stock introduced frequently	Albino	Larro Rabbit pellets and oats			.6/mo. Can expand
Hemlock Hollow Farm, Black Oak Ridge Rd., Paterson RD 4, New Jersey							
				Rockland Guinea Pig Diet	Tested for Salmonella		.7/mo. Can double production
Hilltop Caviary, Box 195, Scottdale, Pennsylvania							
English (short hair) Produced by other breeders			Albino and colored	Fresh greens, hay, pellets			1/wk. Can expand
Hulmac Laboratory, Middletown Springs, Vermont							
Albany	Columbia Univ.			Eastern States Feed		Relatively Res. to Salmonella and Lymphatitis	Can expand

University of Kansas, Dept. of Anatomy, Lawrence, Kansas (William C. Young)							
Strain 2	Nat. Cancer Inst.	Inb. 8–10 gen. at Kansas. Previous inb. approx. 40 gen.	Black, red, white	Purina Rabbit Pellets, oats, alfalfa hay, green vegetables		High res. to tuberculosis	Not presently available
Strain 13	Nat. Cancer Inst.	Inb. 8–10 gen. at Kansas. Previous inb. approx. 40 gen.	Black, red, white; much white			Medium res. to tuberculosis	
Topeka	Dealer in 1949	Random bred	(Records kept on parentage, birth wt., weaning wt., and at monthly intervals)				
Louisville	Univ. of Louisville	Random bred					
Manor Farms, Staatsburg, New York							
				Manor Farms Small Stock Diet	Facilities for disease control		9/yr.
National Institutes of Health, Laboratory Aids Branch, Bethesda 14, Maryland							
Hartley	Tumblebrook	Random			Regularly checked for diseases and parasites by a veterinarian	General purpose work	Breeding stock frequently available
Beltsville	U. S. Dept. Agr. to Heston 1940	Bxs 1906–1933, within strain random bred 1933–1940. Random bred at N				General purpose work	
2	U.S.D.A. 1906–1933 bxs F 30; within strain random bred 1933–1940 Heston 1940, to N. at F 14	F 18	Varicolored; medium reproductivity uniformity; high disseminated calcification in stomach (greater curvature), colon, kidney, striated muscle of abdominal wall, lung aorta in old (24 mo.) animals			Relatively res. to tuberculosis	

TABLE 1C—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED AS OF FALL, 1953	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCES	PRODUCTION
National Institutes of Health, Laboratory Aids Branch, Bethesda 14, Maryland—Continued							
13	U. S. D. A. 1906–1933 bxs F 33; within strain random bred 1933–1940; Heston 1940, to N at F 12	F 17	varicolored; medium good reproduction; uniformity			Less res. to tuberculosis than strain 2; res. to strain 2 transplantable tumors (lymphoma and liposarcoma)	
University of Louisville, Dept. of Anatomy, 101 Chestnut Street, Louisville 2, Kentucky (James B. Rogers)							
R 7		Inb. 10 yrs.	All show unusual longevity	Pioneer rabbit pellets, cabbage, salt spool, water, alfalfa hay bedding	Isolation of sick animals. Maintain a holding and quarantine station 20 miles from colony	Sus. to toxemia of pregnancy	
R 8		Inb. 10 yrs.				Sus. to toxemia of pregnancy and spontaneous tumors	
R 9		Inb. 10 yrs.				Sus. to spontaneous tumors	
Research Supply Company, 2436 West York Street, Philadelphia 32, Pennsylvania							
Rockland Farms, New City, Rockland County, New York							
English (short-haired)		Random within colony	Albino and broken colors. Low incidence Staphylococcus, Streptococcus, respiratory diseases, etc.	Rockland Guinea pig diet		See listing and bibliography pp. 54 and 57–59	.2–.3/wk.

Scientific Small Animal Laboratory and Farm, 1581 Woodland Avenue, Des Plaines, Illinois							
Collects from other breeders			Colored and albino	Rockland Guinea pig diet			1.5–2/mo. either sex 8–20 oz. Can double production
Simonsen Laboratories, Day Road, Gilroy, California							
	University of California	8 gen.	Vari-colored and albino		Facilities available for disease control	General purpose	.5/mo., 3 wks. to 3 mos., 100 gm.—600 gm. fem., virgin or pregnant
E. G. Steinhilber and Company, 2 Josslyn Avenue, Oshkosh, Wisconsin							
Collects from other breeders							
Tumblebrook Farm, Brant Lake, New York							
Hartley					Facilities for disease control		2.5–3/wk.
West Gate Hills Rabbitry, R. D. 2, Bethlehem, Penna.							
Distributor for other breeders							
Woodside Meadows, R. D. 2, Littlestown, Penna.							
Sells for other breeders							
University of Chicago, Zoology Dept., Chicago 37, Illinois (Sewall Wright)							
Heterogeneous stocks containing main genes described			*Color genes* S, s; Si, si; E, e^p, e; A, a; B, b; C, c^k, c^d, c^r, c^a; F, f; P, p; Dm, dm *Hair Character genes* R, r; M, m; St, st *Toe Character Genes* Px, px				Small numbers of breeders available. Whole colony to be disposed of about end of 1954

TABLE 1D—RABBITS

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	DIET USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCE	PRODUCTION
Bio-Lab Breeding Institute and Albino Farms, P. O. Box 597, Bainbridge, New York							
New Zealand	Borden Res. Div.			Camps Small Stock Diet			.9/mo.
Bunnyrun, 360 Third Avenue, Puente, California							
New Zealand White	From 6 original sources Bryant's "Cracker-Jac" McCormick Hamilton Redd Elston Cochran	Inb. often to F_3. Pedigrees of each animal permit calculation of inb. coeff.; some not inb. Closed colony. Bred 5½–6 mos. Birth date of all litters recorded	Albino, mature wt. 9–12 lbs. Ave. litter size at birth 8–11 Ave. litter size weaned 8 (culled) Normal fur	Ambler Rabbit Pellets—weekly supplement of red wheat bran, greens, alfalfa hay, calf-manna to pre- and post-kindling does. Low level antibiotics. Pellets for control of mucoid enteritis	Hutches cleaned weekly. Torch sterilization of cages. Temperature range 85° to 90°. Culling of animals with colds, malocclusion, watery eyes, sore hocks. Post mortems of dead animals. Building strains highly res. to pasteurellosis	Tested in hypertension studies, small minority hypertensive. (73) Very low incidence of mucoid enteritis. Free of ear mite, ring worm or favus. Low mortality of young	Male and female 35/wk. 4–4½ lbs. 140/mo. 8–9 wks. old; litter mates and pregnant females available. Pure unrelated blood lines & crosses
New Zealand Red		Crosses between lines within breeds	Self-colored red; normal fur				
Californian	Fisher	Bred 5½–6 mos., closed colony	Albino with colored extremities, normal fur, mature wt. 9–11 lbs. Ave. litter size 8–11. Ave. litter size weaned 8 (culled)				60/mo. 4–4¼ lbs. 8–9 wks.
Dutch: Black Blue Chocolate Lilac Fawn Black	Bowen Lowitt Davies English (imported)	Closed colonies. Bred 4½ mos.	Normal fur (black) Normal fur (dilute blue) Normal fur (brown) Normal fur (dilute brown) Normal fur (yellow) Rex fur Mature wt. 4½–5 lbs. Litter size birth 8–10, weaned 8			Atomic energy experiments	55/wk. 2¼–2½ lbs. 8–9 wks. bucks 2–3 mo. old always available

Polish: White	From Denison stock, developed from blue-eyed stock at Bunnyrun	Bred at 4 mos.	Blue-eyed, normal fur, albino mature at 2½–3 lbs. Litter size born—2–4, weaned 2–4				Not steadily available
Himalayan	Waterman stock	Bred at 4½ mos.	Albino, colored extremities, normal fur, mature wt. 3–3½ lbs. Ave. litter size 6–8, weaned—7				Not steadily available
New Zealand White			Satin fur				In process of development. Not yet available
Gopher State Caviary, 862 Atlantic Street, St. Paul 6, Minnesota							
New Zealand White		Not inbred. New breeding stock frequently introduced		Larro Rabbit Pellets		General use	.2/mo.
W. W. Griggs, 296 S. 31st Street, San Jose 27, California							
		Maintained pure; no outside stock introduced		Commercial Chow	Wash cages		
Hemlock Hollow Farm, Black Oak Ridge Road, R. D. 4, Paterson, New Jersey							
		Introduced new breeding stock frequently		Rockland Rabbit Ration			.4/mo.
Hilltop Caviary, Box 195, Scottdale, Pennsylvania							
New Zealand White Mostly from other breeders		Introduces new breeding stock frequently		Complete rabbit chow pellets			.6/mo.

TABLE 1D—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCE	PRODUCTION
Hulmac Laboratory, Middleton Springs, Vermont							
				Eastern States Feeds			
Roscoe B. Jackson Memorial Laboratory, Hamilton Station, Bar Harbor, Maine							
III	N. Z. White	22 gen. close breeding plus 4–5 sib. gen.	ccE^d; medium fert.; high fecundity; wt. F. 4000 gm.; male 3800 gm.			High antibody production	Surplus animals of all races available in limited nos. if, as, and when produced from mo. to mo.
III c	From III	18 gen. close breeding plus 4–5 sib. gen.	ccE^d; medium fert.; high fecundity; wt. female 4000 gm., male 3800 gm.			High antibody production, tuberculosis res.	
X	Castle Small race	18 gen. close breeding plus 4–6 sib. gen.	aaeebb, carries c, s, r^2, dw; medium fert., medium fecundity wt. F. 2000 gm, M. 1800 gm., high degree irritability and aggression				
Os	Rockefeller Inst.	4 gen. close breeding	Carries E^d, e, a, d, os, and Du; good fert., good fecundity			Osteopetrosis	
DRD	Rockefeller Inst.	4 gen. close breeding	Carries E, e, a, c; downy-rusty dwarf; good fert., good fecundity; wt. F. 3600 gm.; Male 3200 gm.				
Ac	Rockefeller Inst.	5 gen. close breeding	Achondroplasia (ac), E^d, e, a; good fert.; good fecundity; wt. F. 2300 gm., M. 2150 gm.			Gamma globulin sensitivity	
C	Henry Phipps Inst.	9 gen. close breeding	c or c^H; medium low fert., medium low fecundity; wt. F. 2500 gm.; M. 2250 gm.			Tuberculosis	

	California N. Z. W.		da (achondroplasia)				
	Brown Univ.		ax (ataxia) ch				
	Hammond (Castle 1936)		f (furless)				
	Nachtsheim (Castle, 1936)		r^2 (rex)				
	Rockefeller Inst. (1950)		ac (achondroplasia)				
	Rockefeller Inst. (1950)		av (avitaminosis)				
	Rockefeller Inst. (1950)		wh (wire hair)				
	Rockefeller Inst. (1950)		dw (dwarf)				
	Rockefeller Inst. (1950)		os (osteopetrosis)				
Manor Farms, Staatsburg, New York							
				Manor Farms Small Stock diet, Pelleted	Facilities for disease control		2/yr. in various wt. classes
Research Supply Company, 2436 West York Street, Philadelphia 32, Pennsylvania							
O. Robinson Bunny Ranch, R. D. 2, Box 499, Osceola, Indiana							
N. Z. White	Fry Rabbitry	Line bred 17 gen. All stock from registered ancestors. Breeding stock renewed every 2 years	High producers, rapid growth, large litters (8–13) weaned at 8 wks.	Purina Rabbit checkers	Kill and bury all diseased stock		.3 constantly available to 10 wks. of age, both sexes. Can expand

TABLE 1D—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	DIET USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCE	PRODUCTION
Rockland Farms, New City, Rockland County, New York							
Chinchilla N. Z. White Dutch Check. Giant Flemish Giant	Various	Line bred	Low incidence coccidiosis and respiratory infection	Rockland Rabbit Ration	Low incidence of coccidiosis and respiratory infections	See listing and bibliography pp. 54–55 and 57–59	1/mo.
Scientific Small Animal Laboratory and Farm, 1581 Woodland Avenue, Des Plaines, Illinois							
N. Z. White		New stock introduced for improving colony		Nutrina Rabbit Pellets	Close watch kept of contributing breeders to eliminate disease and infections		1–1.5/mo. Can triple production
Produced by several small breeders							
Shalom Research Farms, Mars, Pennsylvania							
				Allied Mills Rabbit Diet	Facilities available		.2/mo.
Simonsen Laboratories, Day Road, Gilroy, California							
N. Z. White	Local dealer	Inb. 6 gen. no previous inb.			Maintain disease control	Cholesterol studies, good res. to normal rabbit diseases after large doses of radioactive substance	.2/mo. (inb. not presently available)
E. G. Steinhilber, 2 Josslyn Ave., Oshkosh, Wisconsin							
Produced by other breeders							
Joseph E. Stocker, 44 N. Central Avenue, Ramsey, New Jersey							
Chinchilla N. Z. White Dutch Flemish Giant Others on request Produced by other breeders						A. Z. Test	Virgin does, pregnant does, breeders, various wt. classes. 1.5–2/yr.

Tumblebrook Farm, Brant Lake, New York

N. Z. White Polish					Rigorous sanitation and good management practices are employed		

West Gate Hills Rabbitry, R. D. 2, Bethelem, Pennsylvania

N. Z. White (Empire Strain) Californian Some raised by other producers		Inb. 3 gen. Bucks replaced every 1½ yrs., does every 2 yrs.		Purina Rabbit Chow. Some fed antibiotics, some without	Constant culling and removal of inferior animals	Pyrogen and precipitin testing	1/mo. virgin females

Woodside Meadows, R. D. 2, Littletown, Pennsylvania

Procured from various breeders							

TABLE 1E—HAMSTERS

Boston, University, 765 Commonwealth Avenue, Boston 15, Massachusetts

Cricetulus griseus (Chinese hamster)	Tumblebrook	B × S—5–6 gen.	10 strains being developed differing in body size, litter size, age at sexual maturity, regularity of estrus, disposition, cannabalistic tendency				Not yet available

Bucknell University, Biology Department, Lewisburg, Pennsylvania (Hulda Magalhaes). Present address: Hopewell, New Jersey

Marx W Panda	Dealers in Maryland and Wisconsin	Inb. B × S 13 gen. Inb. 10 plus gen. not B × S	Females show a sex-linked lethal gray, luxate and waltzing frequently occur Abnormalities in development of uro-genital system	Purina Lab. Chow checkers, lettuce trimmings, yeast tablets	Facilities present for disease control, trained personnel lacking		Mainly for classroom use Could expand if market for adults were available

Lists of additional breeders of rabbits may be obtained from the *American Rabbit Breeders Association*, 4323 Murray Avenue, Pittsburgh 17, Pennsylvania.

TABLE 1E—Continued

STRAIN	SOURCE	BREEDING SYSTEM	DESCRIPTION	RATIONS USED (AS OF FALL, 1953)	DISEASE CONTROL MEASURES	USES, SUSCEPTIBILITIES, RESISTANCE	PRODUCTION
University of Colorado, Biology Department, Boulder, Colorado							
	Fairfax Rabbit Farm, New Jersey	Selectively inb. since 1944—B × S		Rolled barley and Purina dog checkers; supplement fed separately		Host to 4 kinds of tumors. See J. Nat. Cancer. Inst. 13 (5); 1299–1377, 1953	Very few breeders available
Alvin E. Garber, Sr., 4200 Rodeo Gulch Road, Rt. 2, Santa Cruz, California							
	Wilson Santa Cruz	Inb. 5 gen.		Laboratory chow and rolled barley			.2/wk.
General Biological Supply House, Inc., 761 East 69th Place, Chicago 37, Illinois							
Supplied by various breeders							
W. W. Griggs, 296 South 31st Street, San Jose 27, California							
Gulf Hamstery, (10 Bay Street, Gulf Shores, Alabama) present address 631-26th. St. S, St. Petersburg, Fla.							
Panda	Mutant from Gulf Hamstery, 1949		Spotted				.1/wk. 4–16 wks. old. Can expand
Albino	Mutant from Gulf Hamstery, 1952	Indefinite amount of inbreeding	Albino				
Golden (*Mesocricetus auratus*)	Various sources 1946	No outside stock introduced					
Hemlock Hollow Farms, Black Oak Ridge Road, Paterson, RD 4, New Jersey							
					Facilities for disease control		.2 mo. Can expand

Hi-Way Hamstery, 1022 South 13th Street, Decatur, Indiana							
	4 commercial dealers	Not inbred		Purina Lab. Chow, green vegetables			.1/wk. pregnant females. Can expand
Lakeview Hamstery Colony, P. O. Box 60, Newfield, New Jersey							
				Purina Lab. Chow			6/mo. Can double production
Manor Farms, Staatsburg, New York							
				Manor Farms Small Stock Diet	Means for disease control		2/yr.
Smith's Lovable Golden Hamstery, 7102 W. Washington Street, Indianapolis, Indiana							
		Non-inbred		Lab. Chow, vegetables			.1/mo. Can double production
E. G. Steinhilber and Company, 2 Josslyn Avenue, Oshkosh, Wisconsin							
Collects from other breeders							
Joseph E. Stocker, 44 N. Central Avenue, Ramsey, New Jersey							
Golden Panda Albino Raised by other producers under supervision of stocker				Rockland Farm Ration			2/yr. few breeders. Can expand
Tumblebrook Farms, Brant Lake, New York							
Cricetus auratus *Cricetulus griseus*							.3–1/wk.
S. D. Wilson, 210 Seaview Avenue, Santa Cruz, California							
	Gulf Hamstery	Inb. 3 gen.		Cracked corn, rolled barley, kibbled dog pellets, vegetables			.8/mo. Can expand

TABLE 1F—MISCELLANEOUS ANIMALS

NAME AND ADDRESS	SPECIES	DESCRIPTION	AVAILABILITY
Dahl Biological Specimens, 2017 Second Street, Berkeley 10, California	Frogs		2
	Crayfish		.5
	Amoeba		5 "student units" each
	Paramecium		
	Euglena		
	Hydra		
	Planaria		
General Biological* Supply House, Inc., 761 East 69th Place, Chicago 37, Ill.	Chick embryos		Consult company's catalogue for detailed list of materials available
	Frogs		
	Protozoa	Some pure strains	
	Algae		
Hegener Research Supply, 635 W. 40th St., Sarasota, Florida	Cotton Rats	For virus work	Available in summer
	Cotton Rats	Naturally infested with *Filariae*	
	Cotton Rats	Naturally infested with *Trypanosoma*	
	Rice Rats	Heavily infested with *Trematoda, Nematoda,* and useful for transmission of *Schistosoma mansoni*	
	Raccoons	Naturally infested with *Dirofilaria tenuis* and *Dracunculus insignis*	
	Dogs	Infected with *Dirofilaria immitus*	
	Snails (fresh water)	Infested with different *Cercariae*	Available in summer
	Snails (marine)	Infested with *forktailed Cercariae*	
	Rana pipiens	Heavily parasitized with *Filariae, Trypanosomae, Metacercariae,* etc.	
	Alligators		On permit only
	Crocodiles		
	Birds	(Tropical, for research only)	On permit
	Bullfrogs, turtles, marine toads, poisonous snakes		
Hemlock Hollow Farm, Black Oak Ridge Rd., R. D. 4, Paterson, N. J.	Chickens:		.2/mo.
	Vermont Black Rhode Island Red		
	Barred Plymouth Rocks		
	Leghorns		
	Ducks:		.2/mo.
	White Pekin		
	Pigeons		On order
	Goats and sheep		
E. G. Hoffman and Son, P. O. Box 815, Oshkosh, Wisconsin	Frogs:	Obtained locally	In all sizes and quantities
	Rana pipiens		
	Rana clamitans		
	Turtles (various species)	Obtained locally and from the South	

* See Marine Biological Lab. List.

TABLE 1F—Continued

NAME AND ADDRESS	SPECIES	DESCRIPTION	AVAILABILITY
Iowa State College, Genetics Dept., Ames, Iowa, (W. F. Hollander)	Pigeons	Stocks not pure, but mostly mutants carrying the following genes: b Sex linked — s Autosome I B^a — C St_F — C^t St — c d — o r — ac mi — py — lethal cl at — gr p — Wh L — Od sc — e cr — G my In sy tr al pd	From 1 to 6 specimens usually available without previous reservation
Earle J. Jarvis, Alburg, Vermont	Frogs: *Rana pipiens*	Caught locally	
The Lemberger Company, 1436 South Park Ave., P. O. Box 482, Oshkosh, Wis.	Cats Frogs Turtles Clams Crayfish Tadpoles	Live and preserved	
Lone Trail Kennels, Box 216, Hershey, Penna.	Cats Pigeons Tropical fish		.06 .2
Manor Farms, Staatsburg, N. Y.	Cats		1/yr.
Gilman Marshall, Rose, Wayne Co., New York	Ferrets	Maintained 13 yrs. with no direct inbreeding. Stock disease free	
McDonald's Biological Supply, 155 Lancaster Drive, Walnut Creek, Calif.	Cats		.025/mo.
Meems Bros. and Ward, P. O. Box C, Sparkill, N. Y.	Wild animals Birds Reptiles		Imported by arrangement
Michigan Dept. of Health Labs., DeWitt Road, Lansing 4, Michigan	Cotton Rats: *Sigmodon hispidus hispidus, S. hispidus littoralis*	Trapped from wild then interbred for 12 years	.25/mo. 4–12 wks. old
University of Minnesota, Hormel Institute, Austin, Minnesota (Daniel C. England)	Miniature swine		Limited quantities of castrated male pigs available

TABLE 1F—Continued

NAME AND ADDRESS	SPECIES	DESCRIPTION	AVAILABILITY
University of Chicago, Department of Zoology, Chicago 37, Illinois (Gerald Scherba)	Ants: *Formica ulkei*	(Used in ecology and behavior studies)	
University of Chicago, Zoology Department, Chicago 37, Illinois (Thomas Park)	Certain stored products insects		
California Institute of Technology, Pasadena, California	Extensive *Drosophila* stocks		
Argonne National Laboratory, Lemont, Illinois (Dr. R. J. Flynn)	Grasshoppers		
W. E. Spafford, P. O. Box 381, Kalamazoo, Michigan	Cats	Pregnant and lactating females; Young cats under 2 kg.	.008–.024/wk in late winter, spring and summer
E. G. Steinhilber and Co., 2 Josslyn Avenue, Oshkosh, Wisconson	Cats, frogs, turtles, clams, crayfish, Perch, Earthworms, Leeches, Snails, Toads, Snakes, Mudpuppies, Dogfish, Sturgeons, Garpike		
Tumblebrook Farm, Brant Lake, New York	Cotton Rat (*Sigmodon hispidus*) Snowball Rat (*S. hispidus mutant*) Meadow Vole (*Microtus pennsylvanicus*) White-footed mouse (*Peromyscus leucopus*) Red-backed mouse (*Clethrionomys gapperi*) Woodrat (*Neotoma floridana*) Rice Rat (*Oryzomys palustris*)		.4–1/wk.
Woodside Meadows, R. D. 2, Littlestown, Penna.	Cats Kittens Pigeons Suckling pigs Goats		
Webb Zook, Small Animal Vender, Morgantown, Indiana	Cats		

TABLE 1F—Continued

NAME AND ADDRESS	SPECIES	DESCRIPTION	AVAILABILITY
University of Arkansas, College of Agriculture, Dept. of Animal Industry and Veterinary Sciences, Fayetteville, Arkansas	Poland-China Swine UArk strain	Coeff. Inb. .65, P × O mating, 2 gen.; full b × s 4 gen., then line closed. Two and three sire herd maintained. Excellent combining ability for fast and efficient gains. Cholera vaccination, isolation, and pasture rotation, for disease prevention	Fairly large numbers if 6 month's notice of needs is given. A few available at all times
Hopkins Marine Station, Stanford University, Pacific Grove, California (Dr. C. B. van Niel)	*Tetrahymena pyriformis*	Axenic†	
Department of Biology, St. John's University, New York, New York (Dr. D. M. Lilly)	*Stylonychia pustulata* *Pleurotricha lanceolata* *Tokophrya* sp. *Podophrya* sp.	Monoxenic‡ Monoxenic Monoxenic Monoxenic	
Osborn Zoological Laboratory, Yale University, New Haven, Conn. (Dr. John O. Corliss)	*Tetrahymena pyriformis* *Tetrahymena vorax* *Tetrahymena patula*	Axenic (21 strains) Axenic (3 strain) Axenic (1 strain)	
Biological Laboratories, Amherst College, Amherst, Massachusetts (Dr. George W. Kidder)	*Tetrahymena pyriformis* *Tetrahymena vorax* *Tetrahymena patula* *Glaucoma scintillans* *Colpidium campylum*	Axenic (11 strains) Axenic (3 strains) Axenic (1 strain) Axenic (2 strains) Axenic (1 strain)	

† Axenic—pure (bacteria-free) organisms.

‡ Monoxenic—an organism growing in association with one known strain of microorganism. This implies no extraneous bacteria, yeasts, or molds.

SUPPLIERS OF DOGS

NAME AND ADDRESS	BREED	SOURCE	DISEASE CONTROL	AVAILABILITY
Lone Trail Kennels, Hershey, Penna.	Beagles (pedigreed)		Inoculated for distemper if requested	.1 plus per week
Supplied from producers				
Manor Farms, Staatsburg, New York				1./yr.
McDonald's Biological Supplies, 155 Lancaster Drive, Walnut Creek, Calif.	Mongrel			.05–.07/mo. all sizes
New York State College, of Agriculture, Cornell University, Ithaca, New York	Beagles (registered and pedigreed through several generations)	Raised by animal Husb. Dept.	Immunize against distemper and rabies. Diseased and defective dogs destroyed. Treated for parasites	
Pitman-Moore Company, Biological Labs., Zionsville, Indiana				Produce over 3. yearly, available for research
Woodside Meadows, Littlestown, R. D. 2, Pennsylvania				
Secured from producers				
Webb Zook, Small Animal Vendor, Morgantown, Indiana				

SUPPLIERS OF MONKEYS

NAME AND ADDRESS	SOURCE	DESCRIPTION	AVAILABILITY
Clover Leaf Farms, 114 Greenwich Drive, Bergenfield, N. J.	Imported from India Imported from Philippines	(*Macaca mulatta*) T. B. tested, weighs 3–10 lbs. both sexes (*Macaca cynomolgus*). T. B. tested, weighs 2–6 lbs. both sexes	1. on hand .
International Fertilizer and Chemical Corporation, 39 Broadway, New York 6, N. Y.	Imported directly from country of origin	Rhesus monkeys Chimpanzees	2/mo. (actual number)
Meems Brothers and Ward, P. O. Box C, Sparkill, New York		(*Macaca mulatta*) (*Macaca cynomolgus*)	1.
Midway Trading Co., Inc., c/o State Port, Savannah, Georgia		Rhesus monkeys	.5/mo.
Okatie Farms, Pritchardville, South Carolina		Various species of primates	Available only to grantees of Nat. Sci. Foundation

TABLE 1G—CHICK EMBRYOS AND DAY-OLD CHICKS

NAME AND ADDRESS	BREEDS SUPPLIED	FLOCK DETAILS	EGG WT. RANGE
			oz.
DeWitt's Zeeland Hatchery, Zeeland, Michigan	White Rocks New Hampshire Reds Rhode Island Reds White Leghorns	US Pullorum clean, free from Pullorum infection, Newcastle disease and chronic respiratory disease	23–28
Hall Brothers Hatchery Inc., Wallingford, Conn.	White Leghorns	Conn. Pullorum clean, free from Newcastle disease Pullorum infection and chronic respiratory disease. Used for Vitamin A and D assay. Flocks maintained on uniform rations. Recommended sanitation practices followed	23–28
Nichols Poultry Farm, Inc., Kingston, N. H.	Crossbreds (3-way) of Columbian Line P.B. New Hampshire Reds	US Pullorum clean, free from Pullorum infection. Newcastle inoculated	23–31
Reliable Hatchery, French Street, New Brunswick, N. J.		US Pullorum clean, free from Pullorum infection, Newcastle disease and chronic respiratory disease	24–30
Shamrock Poultry and Breeding Farm, So. Boyd Pkwy. (rt. 14) Colonial Gdns. New Brunswick, N. J. (V. L. Darago)	White Leghorns New Hampshire Reds Broad-breasted bronze turkeys	US Pullorum clean, free from Pullorum infection, Newcastle disease and chronic respiratory disease. No antibiotics used. Eggs cared for under special conditions of sterility. Special trucking facilities to insure proper handling in transportation	23–26
Sunnyside Hatchery, Madison, Wisconsin	White Leghorns White Rocks New Hampshire Reds	Free from Pullorum infection, Newcastle disease and chronic respiratory diseases	24–26
Valley View Hatchery, 1246 Wood Avenue, Hayward, California (Fred Steinor)	New Hampshire Reds White Leghorns	US Pullorum clean, free from Pullorum infection, Newcastle disease and chronic respiratory disease. Incubated in sterilized machine. Eggs fumigated	24–26

TABLE 1H

Living forms supplied to investigators at their home institutions by the Marine Biological Laboratories, Woods Hole, Massachusetts

*Protozoan cultures**
- Chaos chaos
- Ameba
- Euglena
- Paramecium
- Stentor
- Blepharisma
- Spirostomum
- Frontonia
- Euplotes
- Vorticella
- Mixed protozoa

Coelenterata
- Hydra*
- Obelia
- Sertularia
- Metridium
- Astrangia
- Nematostella
- Sargartia

Plathelminthes
- Bdelloura*
- Procotyla
- Planaria*

*Nemathelminthes**
- Metoncholaimus
- Anguillula

Porifera
- Grantia
- Leucosolenia
- Microciona

*Trochelminthes**
- Rotifer

Echinodermata
- Asterias
- Henricia
- Ophioderma
- Arbacia
- Echinarachnius

Annelida
- Hydroides in original tubes
- Lumbricus*
- Macrobdella decora
- Nereis*
- Amphitrite
- Phascolosoma
- Glycera

*Reptilia**
- Turtles
- Crotaphytus

*Miscellaneous**
- Balanced aquaria sets

*Living botanical material**
- Fucus
- Miscellaneous algae, ten or more species
- Elodea

Mollusca
- Anodonta*
- Unio*
- Modiolus
- Yoldia
- Pecten
- Chaetopleura
- Ostrea
- Mytilus
- Venus
- Mya
- Busycon
- Polynices
- Nassa
- Urosalpinx
- Littorina
- Bugula
- Bryozoa nodules

Arthropoda
- Daphnia*
- Artemia salina eggs*
- Cyclops*
- Uca
- Pagurus
- Balanus
- Cancer
- Carcinus
- Libinia
- Panopaeus
- Limulus
- Palaemonetes*
- Gammarus*
- Cambarus*

Tunicata
- Botryllus
- Molgula

*Insecta**
- Tenebrio larvae
- Moth cocoons

Teleostii
- Fundulus
- Ameirus
- Opsanus
- Siphostoma

*Amphibia**
- Ambystoma
- Ambystoma eggs
- Necturus
- Triturus
- Rana pipiens
- Rana catesbiana

* These forms also supplied by General Biological Supply House, Chicago, Illinois.

USES OF LABORATORY ANIMALS*

Mice—*RAP*

Protection tests on antipneumococcus sera—1, 2
Potency tests on antipneumococcus sera—1
Potency tests on meningococcus sera—1
Detection of rabies street virus—1
Production of Frei antigen—1
Potency tests on anaerobic antitoxins—1
Potency tests on staphylococcus antitoxins—1
Potency tests on dysentery antitoxins—1
Potency tests on hemorrhagic septicemia sera—1
Potency tests on anthrax spore vaccine—1
Potency tests on encephalo serum—1
Growth of an etiologic agent (virus) isolated from pemphigis vulgaris—3
Growth of virus from lymphogranuloma inguinale—3
Sarcoma No. 180—6
Hormone assay—5, 7, 8, 9
Endocrine routine—5, 7, 8, 9
Assay of estrogenic substances—11
Estrogenic investigations—45, 46, 47, 48, 49
Protection effect of sulfanilamide against gonococcal toxin—10
Inactivation of gonococcal "toxin" in vitro by sulfanilamide—10
Effect of neoprontosil on bacterial toxins—10
Inactivations of toxins of *Staphylococcus aureus*—10
Toxicity studies in general pharmacology—11
Quantitative Ascheim-Zondek test (diagnosis of pregnancy—2; diagnosis of pathological conditions—9)
Streptococcus infections—12
Staphylococcus infections—12
Bacterial toxins—13
Sulfanilamide therapy—12

Swiss

Propagation of equine encephalitis virus—1
Propagation of rabies virus—1
Protection tests on Meningococcus serum—13
Benz-Pyrene sarcoma—6
Chemo-therapeutic investigations in streptococcus, staphylococcus, pneumonia and influenza—14
Audiogenic seizures—51, 52

C-57 (black)

Carcinoma resistance—15
Potency tests on antityphoid sera—1
Propagation of lymphocytic choriomeningitis virus—1

DBA

Spontaneous adenocarcinoma—6

A/LN

Mammary tumor—74
Lansing strain polio virus—75
Andrew's mouse hepatitus virus—76
Toxoplasmosis infection—77

BALB/cAnN

Low mammary tumor, but high when milk agent is introduced—78

C57BR/cdJN

Low mammary tumor, eosinophil level sensitive to adrenotropic compounds—79

Rats—*Sherman*

Vitamin A, B, D, G assay—2
Sarcoma R-8, R-39 and Jensen—18, 19, 50
Carcinoma (FRC) Flexner-Jobling—18, 19
Walker Carcinoma No. 256—14, 50
Estrogenic and gonadotropic investigations—4, 5, 7, 8
Hormone assay—4, 5, 7, 8, 9
Endocrine routine—4, 5, 7, 8
Streptococcus and other bacterial investigations—2

Long-Evans

Vitamin A, B, D, G, assay—2
Estrogenic and gonadotropic investigations—2
Hormone assay—2
Endocrine routine—2

* Numbers refer to Bibliography of Uses, pp. 57–59.

Guinea Pigs

Determination of potency of diphtheria toxin, antitoxin and botulinus antitoxin—1
Determination of antigenicity of plain diphtheria toxoid—1
Safety tests on diphtheria toxoids—1
Safety tests on tetanus toxoids—1
Determination of potency of anaerobic toxins (tetanus, perfrigen, etc.)—1
Determination of potency of staphylococcus antitoxin—1
Determination of potency of anaerobic antitoxins—1
Determination of antigenicity of diphtheria and tetanus toxoids—1
Determination of potency of anti-equine encephalomyelitis sera—1
Determination of antigenicity of equine encephalomyelitis vaccine—1
Determination of potency of plain tetanus toxoid—1
Tuberculosis fixation determination—2
Wasserman fixation determination—2
Vitamin studies—20
Streptococcus infection—12
Sulfanilamide infection—12
Staphylococcus infection—12
Tubercle bacilli investigations—16, 17

Rabbits—*Chinchilla*

Determination of potency of scarlet fever toxins and antitoxins—1
Determination of potency of staphlococcus toxins and antitoxins—1
Various intradermal detoxification tests—1
Determination of potency of vaccine virus—1
Production of antipneumococcus sera; typing, therapeutic—1
Skin tests—23, 41, 42, 43
Tuberculin skin sensitivity—23
Antibody production—24
Hemolytic streptococcus—25

New Zealand White

Production of antipneumococcus sera; typing, therapeutic—1, 28, 29, 30, 31, 36
Production of antistreptococcus sera; grouping, typing, therapeutic—1
Production of antimeningococcus sera—1
Production of antistaphlococcus sera—1
Biological skin testing—32
Arthritis—33, 34
Pemphigus investigations—35
Hypertension studies—73

New Zealand Red

Production of antipneumococcus sera; typing, therapeutic—1, 28, 29, 30, 31, 36
Production of antistreptococcus sera; grouping, typing, therapeutic—1
Production of antimeningococcus sera—1
Production of antistaphylococcus sera—1

Havana

Antibody production—24
Tuberculin reaction, resistance, susceptibility—37
Skin tests—42, 43, 44

Flemish Giant

Production of antipneumococcus sera; typing, therapeutic—1, 28, 29, 30, 31, 36
Production of antistreptococcus sera; grouping, typing, therapeutic—1
Production of antimeningococcus sera—1
Production of antistaphylococcus sera—1
Antibody production—24

Checkered Giant

Production of antipneumococcus sera; typing, therapeutic—1, 28, 29, 30, 31, 36
Production of antistreptococcus sera; grouping, typing, therapeutic—1
Production of antimeningococcus sera—1
Production of antistaphylococcus sera—1

Champagne De Argent

Production of antipneumococcus sera; typing, therapeutic—1, 28, 29, 30, 31, 36
Production of antistreptococcus sera; grouping, typing, therapeutic—1
Production of antimeningococcus sera—1
Production of antistaphylococcus sera—1

Himalayan

Antibody production—24
Tuberculin reactions, resistance, susceptibility—37

Dutch

Antibody production—24

English

Antibody production—24

Hare Brown

Brown-Pearce tumor work—38
Tuberculin skin sensitivity—23
Toxicological studies—39

Where breed or color is not a prerequisite, larger numbers of rabbits are used for other special studies and routine, as for instance:

Determination of lethal dose of staphylococcus toxins—1
Determination of potency of typhoid vaccines—1
Preparation of rabies vaccine (Semple)—1
Estrogenic and gonadotropic investigations—26, 27
Phenomenon of local tissue reactivity since 1935—41
Physiological observations—2
Friedman modified pregnancy determination—2
Other routine uses too numerous to mention.

Hamsters

Experimental rickets—53
Susceptibility to encephalitis virus—54, 55
Infection with mare abortion virus—56
Test for leptospirosis—57, 63, 70
Use in pregnancy test—58
Hibernation studies—59
Use in endocrinology—60
Infection with Johne's bacteria—61, 62
Transmissable Tumors—64
Leprosy susceptibility—62, 65, 66
Leishmania infection—67
Vitamin studies—68, 69
Entamoeba infection—71
Tuberculosis testing—72

INTERNATIONAL EXCHANGE

One of the original plans in the setting up of the Institute of Animal Resources was to explore and develop the field of international exchange of laboratory animal stocks of special characteristics and significance which are not available in this country. In turn, strains existing in the United States which would be of service abroad could also be exchanged. Thus there would be available a greater diversity of material for research, and there would be created a potential reservoir from which to replete depleted stocks, or stocks wiped out by accident or unforseen contingencies. Problems which would have to be solved include cataloging of stocks, restrictions on the importation of laboratory animals, shipping regulations, diseases, quarantines and others. The work of the Laboratory Animals Bureau in England with its periodic Mouse News Letter, and the General Embryological Information Service of the Hubrecht Laboratory of Utrecht, Holland, are examples of what may be undertaken on an international basis in the field of animal research.

BIBLIOGRAPHY OF USES OF LABORATORY ANIMALS*

1. Lederle Laboratories, Inc.
2. Numerous small institutions.
3. Grace, W. A. and Suskind, F. H.: 'Lymphogranuloma Inguinale' Arch. Derm. and Syph., Vol. 33, p. 853–864, (May) *1936;* Vol. 34, pp. 65–78, (July) *1936*. 'An Agent Transmissible to Mice, Obtained During a Study of Pemphigus Vulgaris'; Jour. Exp. Biol. and Med. Vol. 37, pp. 324–326, *1937*. 'An Investigation of the Etiology of Pemphigus Vulgaris'; Jour. Inv. Derm. Vol. 2, No. 1, (Feb.) *1939*. 'Frei Antigen Prepared from Mouse Brain'; Arch. Derm. and Syph., Vol. 39, pp. 347–348, (Feb.) *1939*.
4. Salmon, Udall J.: 'Gonadotropic Effect of Androgens upon the Immature Rat Ovary'; Proc. Soc. Exp. Biol. and Med., Vol. 38, pp. 352–353, *1938*. 'The Effect of Testosterone Propionate on the Genital Tract of the Immature Female Rat'; Endo., Vol. 23, No. 6, pp. 779–783, (Dec.) *1938*.
5. Salmon, Udall J. and Frank, R. T.: 'Extraction of Gonadotropic Factors from the Blood. Improved Technic'; Proc. Soc. Exp. Biol. and Med., Vol. 34, pp. 363–364, *1936*. 'Quantitative Relation Between Follicle Stimulating and Luteinizing Effects in Castrate and Menopause Urine'; Proc. Soc. Exp. Biol. and Med., Vol. 34, pp. 463–466, *1936*. 'Gonadotropic Excretion in the Male Castrate. Effect of the Male Sex Hormones'; Proc. Soc. Exp. Biol. and Med., Vol. 34 pp. 804–805, *1936*. 'Time Factor Relationship of Follicle Stimulation and Luteinization in the Immature Rat'; Proc. Soc. Exp. Biol. and Med., Vol. 34, pp. 493–495, *1936*. 'Effect of Emmenin on Gonadotropic Hormone Excretion in Castrates and Spontaneous Menopause'; Endo., Vol. 21, No. 4, pp. 476–480, (July) *1937*.
6. Lewisohn, Richard: 'Effect of Subcutaneous Injections of Concentrated Spleen Extract on Mouse Sarcoma No. 180'; Surg. Gynec. and Obst., Vol. 66, pp. 563–576, (March) *1938*.
7. Frank, R. T., Goldenberger, M. A. and Salmon, Udall, J.: 'Estrogenic Substances in the Blood and Urine after Castration and the Menopause'; Proc. Soc. Exp. Biol. and Med. Vol. 33 pp. 615–616, *1936*. 'The Menopause; Symptoms, Hormonal Status and Treatment'; N. Y. State Jour. Med., Vol. 36, No. 19 (October) *1936*. 'Amenorrhea: Its Causation and Treatment'; Jour. A. M. A., Vol. 109, pp. 1863–1869, (Dec.) *1937*.
8. Frank, R. T.: 'A Comparison of Four Methods of Bio-Assay for the Gonadotropic Factors'; Endo., Vol. 25, No. 5, pp. 683–689, (Nov.) *1939*.
9. Ferguson, R. S.: 'Quantitative Behavior of Prolan A in Teratoma Testis'; Amer. Jour. Cancer, Vol. 18, pp. 269–295, *1933*.
10. Carpenter, C. M., Hawley, P. L. and Barbour, G. M.: 'The Protective Effect of Sulfanilamide in Mice Against Gonococcal Toxin'; Science, Vol. 88, No. 2292, pp. 530–531, (Dec.) *1938*. 'The Inactivation of Gonococcal "Toxin" in Vitro by Sulfanilamide'; Jour. Bact., Vol. 36, No. 3, (Sept.) *1938*.

    Carpenter, C. M. and Barbour, G. M.: 'Effect of Neoprontosil on Bacterial Toxins'; Proc. Soc. Exp. Biol. and Med., Vol. 41, pp. 255–259, *1939*. 'Inactivation of Toxins of Staphylococcus Aureus and Clostridium Welchii in Vitro by Sulfanilamide'; Proc. Soc. Exp. Biol. and Med., Vol. 41, pp. 354–357, *1939*.
11. Foster, R. H. K.: Unpublished Report; Hoffman-LaRoche, Inc. Nutley, N. J.
12. Meyer, F.: 'Streptococcus Infection and the Mechanism of its Healing by Serum and Chemotherapy'; Quarterly Bulletin Seaview Hospital, New York City, *1937*. 'The Management of Staphylococcus Infections'; Quarterly Bulletin, Seaview Hospital New York City, *1938*. 'New Studies in Sulfanilamide Therapy'; Quarterly Bulletin, Seaview Hospital, New York City, *1938*.
13. Alexander, H. E.: 'Response to Antiserums in Meningococcic Infection of Human Beings and Mice'; Amer. Jour. Dis. Child., Vol. 58, No. 4, pp. 746–752, (Oct.) *1939*.
14. Climenko, D. A. and Feinstone, W. H.: Unpublished Report. The American Cyanamid Company, Stamford, Conn.
15. Haagensen, C. D.: Personal Communication. Department of Surgery, Columbia University, New York City.
16. Freund, Jules and Angevine, D. M.: 'The Spread of Tubercle Bacilli in the Bodies of Sensitized and Immunized Animals'; Jour. Imm. Vol. 35, No. 4, (Oct.) *1938*.
17. Freund, Jules, Casals, J. and Hosmer, Eliz. P.: 'Sensitization and Antibody Formation after Injection of Tubercle Bacilli and Paraffin Oil'; Jour. Exp. Biol. and Med., Vol. 37, pp. 509–515, *1937*.
18. Woglum, W. H.: 'Recovery in Lokis Solution of a Retarding Agent From Immune Rats'; Amer. Jour. Cancer, No. 30, pp. 12–31 (July), *1937*.
19. Sugiura, Kanematsu: 'Studies on Radiosensitivity of Mouse Sarcoma No. 180 Irradiated in Vivo and in Vitro'; Radiol, Vol. 29, No. 3, pp. 352–361, (Sept.) *1937*. 'The Effect of Extracts of Different Organs and Tissues upon the Viability of Transplantable Tumors'; Amer. Jour. Cancer Vol. XXXII, No. 1, pp. 126–134. (Jan.) *1938*. 'The Biological Measurement of Gamma Rays in 'Equivalent Roentgens', using Mouse Sarcoma No. 180 as the Test Object'; Amer. Jour. Cancer, Vol. 37; (Nov.) *1939*.
20. Kleiner, I. S.: 'Vitamin Studies', unpublished, Flower—5th Avenue Hospital, New York City.
21. Accepted by the American Rabbit Breeders

* This list is by no means complete and many of the older references have doubtless been superseded by more recent research.

Association, 4323 Murray Avenue, Pittsburgh 17, Penna. The only national association recognized by the Federal Government. Breeds of rabbits and guinea pigs are accepted only after a Standard of Perfection of a respective breed has been adopted and made part of their operating responsibilities.

22. Darwin, Charles R.: 'Animals and Plants under Domestication'; John Murray, Albermarle Street, London *1868*.
23. Freund, Jules, Laidlaw, E. H. and Mansfield, J. S.: 'Hypersensitiveness and Antibody Formation in Tuberculous Rabbits'; Jour. Exp. Med., Vol. 64, No. 4, pp. 573–582, (Oct.) *1936*.
24. Culbertson, J. T.: 'The Relative Precipitin Response of Various Breeds of Rabbits; The Possibility of a Genetic Factor in Antibody Production'; Amer. Jour. Hyg., Vol. 22, No. 1, pp. 190–198, (July) *1935*.
25. Angevine, D. Murray: 'The Fate of a Virulent Hemolytic Streptococcus Injected into the Skin of Normal and Immunized Rabbits'; Jour. Exp. Med., Vol. 64, No. 1, pp. 131–147, (July) *1936*. 'The Fate of Avirulent Hemolytic Streptococci Injected into the Skin of Normal and Sensitized Rabbits'; Jour. Exp. Med., Vol. 60, No. 3, pp. 269–285, (Sept.) *1934*. 'Differences in Immunization and Sensitization in Rabbits Injected with Relatively Avirulent or Highly Virulent Cultures of the Same Strain (H) of Hemolytic Streptococcus'; Jour. Exp. Med., Vol. 69, No. 2, pp. 211–227, (Feb.) *1939*.
26. Friedman, Maurice H.: 'Criteria for the Selection of Estrous Rabbits'; Endo., Vol. 22, No. 3, pp. 354–359, (Mar.) *1938*. 'The Assay of Gonadotropic Extracts in the Post-Partum Rabbit'; Endo., Vol. 24, No. 5 pp. 617–625, (May) *1939*. 'Seasonal Variations in the Gonadotropic Hormone Content of the Rabbit Pituitary'; Endo., Vol. 24, No. 5, pp. 626–630, (May) *1939*.
27. Bachman, Carl, Gurin, Samuel and Wilson, D. W.: 'The Nature of the Carbohydrate in the Gonadotropic Substance of Pregnancy Urine'; Science, Vol. 89, No. 2299, pp. 62–63, (Jan.) *1939*. 'The Gonadotropic Hormone of Urine of Pregnancy'; Jour. Biol. Chem., Vol. 128, No. 2, pp. 525–536, (May) *1939*.
28. Goodner, Kenneth, Horsfall, F. L. and Dubos, R. J.: 'Type Specific Antipneumococci Rabbit Serum for Therapeutic Purposes'; Jour. Imm., No. 33, pp. 279, (October) *1937*.
29. Horsfall, F. L., Goodner, Kenneth, Macleod, C. M. and Harris, A. H.: 'Antipneumococcus Rabbit Serum as a Therapeutic Agent in Lobar Pneumonia'; Jour. A. M. A., No. 108, pp. 1483, (May), *1937*.
30. Horsfall, F. L., Goodner, Kenneth and Macleod, C. M.: 'Antipneumococci Serum as a Therapeutic Agent in Lobar Pneumonia'; N. Y Jour. Med. No. 38, p. 245, (Feb.) *1938*.
31. Loughlin, E. H.: 'Treatment of Lobar Pneumonia With Rabbit Antipneumococcus Serum'; Jour. A. M. A., No. 111, p. 497, (Aug.) *1938*.
32. Pease, Herbert D. and Macbrayer, R.: 'Conduct of Tests for the Determination of the Effect of Antiseptic Agents'—'Purpose of Determining the Presence or Absence of Coal Tar and Allied Dyes'—'Purpose of Determining the Presence or Absence of Toxicity of Chemical Agents of the Skin and Body Tissues'—'Determination of Skin Absorption and Penetration of Toxic Metals'. Personal communication, Peace Laboratories, 39 West 38th St., New York City.
33. Angevine, D. Murray and Cecil, R. L.: 'Experimental Streptococcus Arthritis in Rabbits'; Ass'n. Amer. Phys., Vol. liii, p. 310, *1938*.
34. Bergens, Conrad, Angevine, D. M., Guy, Loren and Rothbard, Sidney: 'Eye Lesions in Experimental Infections'; Amer. Jour. Ophth., Vol. 21, pp. 1315–1327, (Dec.) *1938*.
35. Grace, Arthur, W.: 'Effect of Pemphigus Serum on the Leukocytic Picture of Rabbits'; Arch. Derm. and Syph., Vol. 29, pp. 885–886, (June), *1934*. 'Evidence in Support of a Bacteremia as an Explanation of Certain Terminal Changes in the Blood Picture'; Arch. Derm. and Syph., Vol. 30, pp. 22–29, (July) *1934*.
36. Heidelberger, M., Turner, J. C. and Soo Hoo, C. M.: 'Preparation and Administration of Globulin from Rabbit Antipneumococcus Sera'; Jour. Exp. Biol. and Med., No. 37, pp. 734–736, *1938*.
37. Freund, Jules: 'The Effect of Heterologous Bacterial Products upon Tuberculous Animals'; Jour. Imm., Vol. 30, p. 241, (March) *1936*.
    Freund, Jules and Opie, Eugene L.: 'Sensitization and Antibody Formation with Increased Resistance to Tuberculous Infection Induced by Heat Killed Tubercle Bacilli'; Jour. Exp. Med., Vol. 68, No. 2, pp. 273–298, (Aug.) *1938*. 'An Experimental Study of Protective Inoculation with Heat Killed Tubercle Bacilli'; Jour. Exp. Med., Vol. 66, No. 6, pp. 761–788, (Dec.) *1937*. 'The Spread of Tubercle Bacilli in the Bodies of Sensitized and Immunized Animals' Jour. Imm., Vol. 35, No. 4, pp. 271–288, (Oct.) *1938*.
38. Firor, Warfield M.: Unpublished Report—95% Susceptibility, Surgical Hunterian Laboratory, Johns Hopkins University, Baltimore.
39. Kleiner, I. S.: 'Toxicological Studies': Unpublished Report; Flower-5th Avenue Hospital, New York City.
40. Castle, W. E.: Harvard University, Cambridge, Massachusetts.
41. Shwartzman, Gregory: 'Phenomenon of Local Tissue Reactivity'; Harper Brothers, New York City, These studies were concerned with the mechanism of the Shwartzman Phenomenon and also dealt with the titration of antitoxic B. Coli Meningococcus and B. Typhosus antisera capable of neutralizing this phenomenon. *1937*.
42. Rous, Peyton: 'The Carcinogenic Effect of a Papilloma Virus on the Tarred Skin of Rabbits. I—Description of the Phenomenon'; Jour. Exp. Med. Vol. 67, pp. 399–428, (March) *1938*. 'A Comparison of Virus-Induced Rabbit Tumors with the Tumors of Unknown Cause Elicited by Tarring'; Jour. Exp. Med., Vol. 69, No. 3, pp. 399–424, (March), *1939*.
43. Kidd, John C.: 'The Carcinogenic Effect of a

Papilloma Virus on the Tarred Skin of Rabbits. II—Major Factors Determining the Phenomenon; the Manifold Effects of Tarring'; Jour. Exp. Med., Vol. 68, pp. 529–562, (Oct.) *1938*.

44. Rivers, Thomas M., Ward, S. M. and Smadel, J. E.: 'Infections Myxomatosis of Rabbits—Studies of a Soluble Antigen Associated with the Disease'; Jour. Exp. Med., Vol. 39, No. 1, pp. 31–48, (Jan.) *1939*.
45. Pincus, Gregory: 'The Eggs of Mammals'; The Macmillan Co., New York City. *1936*.
46. Burdick, H. O., Whitney, Rae and Pincus, Gregory: 'The Fate of Mouse Ova Tube-Locked by Injections of Oestrogenic Substances'; Anat. Rec., Vol. 67, No. 4 and Supplement No. 3, pp. 513–519, (March) *1937*.
47. Burdick, H. O. and Whitney, Rae: 'Acceleration of the Rate of Passage of Fertilized Ova Through the Fallopian Tubes of Mice by Massive Injections of an Estrogenic Substance'; Endo., Vol. 21, No. 5, pp. 637–643, (Sept.) *1937*. 'Fate of Ova Accelerated in their Rate of Passage Through the Fallopian Tubes of Mice by Massive Injections of Progynon B.' Endo., Vol. 22, No. 6, pp. 631–638, (June), *1938*.
48. Whitney, Rae: 'Effect of Massive Doses of an Estrogen on Ova Transport in Ovariectomized Mice'; Endo., Vol. 24, No. 1, pp. 45–49, (Jan.) *1939*.
49. Taylor, Howard C., Jr.: 'Hormone Factors in the Toxemias of Pregnancy; with Special References to Quantitative Abnormalities of Prolan and Estrogens in the Blood and Urine'; Amer. Jour. Obst. and Gyn., pp. 963–985, (June), *1939*.
50. Heiman, Jacob: 'The Anterior Pituitary Gland in Tumor Bearing Rats'; Amer. Jour. Cancer, Vol. XXXIII, No. 3, p. 423, (July) *1938*.
51. Frings, Hubert and Frings, Mable: Development of Strains of Albino Mice with Predictable Susceptibilities to Audiogenic Seizures. Science 117 (3037); 283–284, 1953.
52. Frings, Hubert and Frings, Mable: The Production of Stocks of Albino Mice with Predictable Susceptibilities to Audiogenic Seizures. Behaviour 5: 305–319, 1953.
53. Jones, J. H.: Experimental Rickets in the Hamster Jour. Nutr. 30 (2): 143–146, *1945*.
54. Watson, D. W. and Smadel, J. E.: Susceptibility of Hamsters to Peripheral Inoculation of Western, Eastern, and West Nile Encephalitis Viruses. Proc. Soc. Exp. Biol. and Med. 52 (2): 101–104, *1943*.
55. Shahan, M. S. and Creech, G. T.: Notes on susceptibility of the golden hamster (*Cricetus auratus*) to equine encephalomyelitis virus. Amer. Jour. Vet. Res. 3 (7): 193–194, *1942*.
56. Anderson, K. and Goodpasture, E. W.: Infection of newborn Syrian hamster with the virus of mare abortion (Dimock and Edwards). Amer. Jour. Pathol. 18 (4): 555–561. *1942*.
57. Randall, Raymond and Cooper, Harold K.: The golden hamster (*Cricetus auratus*) as a test animal for the diagnosis of leptospirosis. Science 100 (2589): 133–134, *1944*.
58. Gale, Louis Clyde: Hamsters in pregnancy tests. Mimeo published by Louis Clyde Gale, Goodland, Kansas, *1948*. (Available to physicians and laboratories on request.)
59. Lyman, Charles P.: The oxygen consumption and temperature regulation of hibernating hamsters. Jour. Exp. Zool. 109 (1): 55–78, *1948*.
60. Peczenik, O.: Some features of the golden hamster from the point of view of endocrinology. 35th Conference Socy. Exp. Biol. *1942*.
61. Francis, J.: Infection of laboratory animals with Mycobacterium johnei. Jour. Comp. Pathol. and Therap. 53: 140–150, *1943*.
62. Francis, J.: Infection of laboratory animals with Johne's disease and leprosy. Nature (London) 152: 250–251, *1943*.
63. Larson, Carl L.: Experimental leptospirosis in hamsters (*Cricetus auratus*). Pub. Health Rpts. 59 (16): 522–527, *1944*.
64. Ashbel, R.: Spontaneous transmissable tumors in the Syrian hamster. Nature 155 (May 19) 607, *1945*.
65. Balfour-Jones, S. E. B.: The experimental transmission of rat leprosy to the golden hamster (*Cricetus auratus*). Jour. Path. and Bact. 45: 739, *1937*.
66. Doull, James A. *et al.*: Inoculation of human leprosy into the Syrian hamster. Int. Jour. Leprosy 7: 509–512, *1939*.
67. Goodwin, L. G.: Oedema in hamsters infected with leishmania, Bibliog. Nature 156 (0.20): 476, *1945*.
68. Clausen, D. F. and Clark, W. G.: Vitamin C. requirements of the Syrian hamster. Nature 152 (S.11): 300–301, *1943*.
69. Houchin, O. B.: Vitamin E and muscle degeneration in the hamster. Proc. Fed. Amer. Soc. Expt. Biol. 1 (no. 1, part 2): 117–118, *1942*.
70. Morton, H. E.: Susceptibility of Syrian hamsters to leptospirosis. Proc. Soc. Exp. Biol. and Med. 49: 566, *1942*.
71. Neal, R. A.: Entamoeba sp. from the Syrian hamster (*Cricetus auratus*). Nature 159 (ap. 12): 502, *1947*.
72. Ungar, J.: Golden hamster as a test animal for tubercular infection. Nature 150 (0.10): 432, *1942*.
73. Medical Department, University of Southern California.
74. NIH, unpublished data.
75. Habel, NMI unpublished data.
76. Morris, AMC unpublished data.
77. Jacobs, NMI unpublished data.
78. Jour. Nat. Cancer Inst. 1: 147. *1940–41*.
79. Endocrinology 45: 403. *1949*.

REFERENCES

The following general references on the care and management of laboratory animals were considered an adequate, though modest, listing for most purposes by the A. V. M. A. Committee on the Veterinary Care of Laboratory Animals. A more complete listing (41 pages of references by 1952) has been released through the efforts of Dr. Jules Cass and Miss Irene Campbell of the Kettering Laboratories of the University of Cincinnati, and is called the Reference Information File of the Animal Care Panel.

Note, too, in other areas of this handbook, the specific references dealing with specific areas of information.

Books

Animal Colony Maintenance. Symposium on Animal Colony Maintenance held by the Section of Biology of the New York Academy of Science, November 10 and 11, 1944. Published in the Annals of the New York Academy of Sciences. Volume XLVI. Art. 1. (June 15, 1945) pp. 1–126.

Asdell, S. A. *Patterns of Mammalian Reproduction*, Ithaca, New York: Comstock Publishing Company, 1946.

Beister, H. E. and L. H. Schwarte, eds. *Diseases of Poultry.* Second Edition. Ames, Iowa: Iowa State College Press, 1948.

Farris, Edmond J., Ed. (and fifteen contributors). *The Care and Breeding of Laboratory Animals.* New York: John Wiley & Sons, Inc., 1950.

Farris, Edmond J. and John Q. Griffith, eds. *The Rat in Laboratory Investigation.* Second Edition Philadelphia: J. B. Lippincott Company, 1949.

Galtsoff, P. S., Lutz, F. E., Welch, P. S. and Needham, J. G. *Culture Methods for Invertebrate Animals.* Ithaca, New York: Comstock Publishing Company, 1937.

Hoskins, G. Preston, Lacroix, J. V. and Karl Mayer, eds. *Canine Medicine* Evanston, Illinois: American Veterinary Publications, Inc. 1953.

McCay, Clive M. *Nutrition of the Dog.* Ithaca, New York: Comstock Publishing Company, 1949. Second Edition.

Rat Quality: A Consideration of Heredity, Diet and Disease. Proceedings of the Symposium held at Columbia University, College of Physicians and Surgeons, New York, New York, January 31, 1952. New York: The National Vitamin Foundation Incorporated, November, 1953.

Snell, George D., ed. *et al. Biology of the Laboratory Mouse.* (Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine). With a chapter on Infectious Diseases of Mice, by J. H. Dingle. Philadelphia: Blakiston Company, 1941.

Periodicals

Carworth Farms Quarterly Letter. New City, (Rockland County), New York. April 1, 1946.

Gaines Dog Research Progress. Published periodically by Gaines Dog Research Center, 250 Park Avenue, New York 17, New York.

The Journal of the Animal Technicians Association. Issued quarterly. Vol. 1, No. 1. (June, 1950).

Laboratory Animals Bulletin. Periodical bulletin published by Laboratory Animals Bureau (Unit of the Medical Research Council), M. R. C. Laboratories, Holly Hill, Hampstead, London, N. W. 3 No. I September, 1950.

Nutrition News Bulletin. Published by Ralston Purina Company. Vol. I. No. 1, 1945.

Proceedings of the Animal Care Panel: 1. November 28, 1950. 2. November 29–30, 1951. 3. December 3–4, 1952.

Turtox News. Vol. 1 No. 1, January, 1923—published by General Biological Supply House. 761–763 East 69th Place, Chicago 37; Illinois.

The Care of Captive Animals by Ernest P. Walker, Assistant Director National Zoological Park. This is Publication #3664 of the Smithsonian Institution, Washington, D. C. It is available from the Government Printing Office. 61 pp. with 12 plates.

Additional references of use to producers or workers with laboratory animals. This list is not complete. Inclusion of any reference is not an endorsement by the Institute, nor is omission evidence of disapproval or inferiority.

Care and Management

Greeman, Milton J. and Dehring, F. Louise, *Breeding and Care of the Albino Rat for Research Purposes*, Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania.

Worden, Alastair N., *The UFAW Handbook on the Care and Management of Laboratory Animals*, Williams and Wilkins, Baltimore, Maryland.

Poiley, Samuel M., *The Care and Breeding of Laboratory Animals*, John Wiley and Sons, New York City, New York.

Carnochan, F. G. *Cavy Management*, Carworth Farms, New City, Rockland County, New York.

Keeler, Clyde E., *The Laboratory Mouse*, Harvard University Press, Cambridge, Massachusetts.

Herrlein, Harry G., *A Practical Guide on the Care of Small Animals for Medical Research*, Rockland Farms, New City, Rockland County, New York.

The following may be procured from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

L 250. Hamster Raising.

L 252. The Guinea Pig.

L 253. Raising Laboratory Mice and Rats.

FB 1730. Rabbit Production.

Diseases

Cherry, W. B., Davis, Betty R. and Edwards, Philip R. Observations on the types and typing of Salmonella paratyphi B. cultures in the United States. American Journal of Public Health 43 (10):

1280 October, 1953. Summarizes results of a study of 500 Salmonella cultures.

JAFFE, R. (editor) *Anatomie und Pathologie der Spontanerkrankungen der Kleinen Laboratoriumstiere:* Kaninchen, Meerschweinchen, Ratte, Maus, Berlin, Springer 1931.

GERLACH, F. *Die Praktisch Wichtigen Spontaninfektionen der Versuchstiers.* Kolle, W., Kraus, R. und Uhlenhuth, E. Editors. Handbuch der pathogenen Mikroorganismen. III Aufl., Fischer, 1929, 497–526.

MEYER, K. F. *Communicable Diseases of Laboratory Animals.* Jordan, E. O. and Falk, I. S. Editors. The newer knowledge of bacteriology and immunology. Chicago—University of Chicago Press. 1928, 607–638.

Genetics

FALCONER, D. S. *The Improvement of Laboratory Animals by Selective Breeding.* Jour. of the Animal Technicians Association 3 (No. 1).

The Genetics of the Dog. Marca Burns 1952. 96 pp. Illus. Commonwealth Agricultural Bureaus, Farnham Royal, Slough, Bucks, England.

Hamsters

BOND, CHARLOTTE R. The golden hamster (*Cricetus auratus*) Care, Breeding and Growth. Physiol. Zool. 18 (1): 52–59. 1945.

BRUCE, H. M. AND R. HINDLE. The golden hamster *Cricetus aura* (*Mesocricetus*) *auratus* Waterhouse. Notes on its breeding and growth. Proc. Zool. Soc. London, Vol. 2, pp. 361–366. 1934.

COOPERMAN, J. M., H. A. WAISMAN, AND C. A. ELVEHJEM. Nutrition of the golden hamster. Proc. Soc. Expt. Biol. and Med. Volume 52, pp. 250–254. 1943.

DEANSLEY, RUTH. The reproductive cycle of the golden hamster (*Cricetus auratus*) Proc. Zool. Soc. London Vol. 108, pp. 31–37. 1938.

GRAVES, A. P. The development of the golden hamster (*Cricetus auratus* Waterhouse) during the first nine days. Amer. Jour. Anat. Vol. 77 pp. 219–251. 1945.

HAYNER, A. Successful hamster raising. Small Stock Mag. Vol. 29, p. 34. 1945.

KEYES, P. H. AND P. P. DALE. A preliminary survey of the pouches and dentition of the Syrian hamster. Jour. Dent. Res., Vol. 23 pp. 427–438. 1944.

LAIDLAW, P. The maintenance of the golden hamster. Int. Jour. Leprosy, Vol. 7, pp. 513–516. October–December. 1939.

MORTON, H. E. The use of the Syrian hamster as a laboratory animal. Jour. Bacteriology, Vol. 45 p. 194. 1943.

UNGAR, JR. The golden hamster as a test animal for tubercular infection. Nature (London) Vol. 150. No. 3806, p. 432, October 10, 1942.

Techniques

JORGENSEN, L. AND WELCH, J. B. ST. VINCENT. Pregnancy Test: Australian reptiles as test animals. Med. Jour. of Australia, p. 564. October 10, 1953. Describes a pregnancy test for *Hyla aurea*, a common green and gold Australian swamp frog.

Frogs and Their Employment in Early Pregnancy Diagnosis. A handbook containing complete history, techniques, and detailed instructions for use and care of the *Rana pipiens* male frog in testing for pregnancy. E. G. Steinhilber and Company, Oshkosh, Wisconsin, 16 pages.

KASSEL, ROBERT AND LEIRTAN, SEYMOUR. A jugular technique for the repeated bleeding of small animals. *Science* 118 (3071): 563, November 6, 1953. Procedure for holding animals in proper position for vein puncture and introduction of 26 gauge needle into dilated external jugular vein.

FISK, ROY T. *Manual of Blood Grouping and Rh Typing Serums*, 27 pp. Published by Hyland Laboratories, Inc. 4501 Colorado Blvd. Los Angeles 39, California. Summaries of principles and techniques of blood groups and typing. Immunological characteristics of red blood cell iso-sensitization, selector of blood donor, procedures for cross matching, Rh antibody titration, Coombs antiglobulin test.

FREYTAG, ROBERT E., HULLINGHORST, L., HUNTER, GEORGE W., III, AND RITCHIE, L. S. Comparison of *Xenopus laevis* and *Rana nigromaculata* as test animals for the determination of pregnancy. Jour. Lab. and Clin. Med. 42 (4): 646, October, 1952. *Rana nigromaculata*, a local frog, gives as good results for detection of normal pregnancies as those obtained from *Xenopus laevis*.

Miscellaneous

Advances in Cancer Research. Edited by Jesse P. Greenstein and Alexander Haddow. Vol. 1, 1953, XII, 590 pp. Vol. 2, 1954. Academic Press Inc. 125 E. 23rd Street, New York 10, New York.

Atlas of Tumor Pathology. An illustrated guide to tumor variations. 40 fascicles 17 of which are published. Each in loose leaf form. Available from American Registry of Pathology, Armed Forces Institute of Pathology, Washington 25, D. C.

Pigment Cell Growth. Proc. Third Conference on Biology of Normal and Atypical Pigment Cell Growth Edited by Myron Gordon. 1953 XVI, 365 pp., Academic Press, Inc. 125 E. 23rd Street, New York 10, New York.

List of Domesticated Animals in North America. Edward A. Benbrook. 1952. 63 pp. Burgess Publishing Company, Minneapolis, Minnesota.

Drosophila Information. Department of Genetics, Carnegie Institute of Washington, Cold Spring Harbor, Long Island, New York.

Lillie's Development of the Chick. An Introduction to Embryology, Revised by Howard L. Hamilton, Assoc. Prof. Zool., Iowa State College, Ames, Iowa. Third Ed. 1952, Henry Holt and Company, New York.

Keeping and Breeding Aquarium Fishes. C. W. Emmens, 1953. Academic Press, Inc. 125 E. 23rd Street, New York 10, New York.

Transactions N. Y. Academy of Sciences Series II 15(6). 1953.

Ross F. Nigrelli. The fish in biological research pp. 183–186.

Grace E. Pickford. The fish in endocrinological research pp. 186–188.

Alfred Perlmutter. Population studies of the rosefish. pp. 189–191.

Myron Gordon. The use of fishes in the evaluation of heredity in atypical pigment cell growth. pp. 192–195.

File of over 5500 references on the dog. Maintained by Marcus M. Mason, Animal Clinic, 20 Harvard Street, Worcester 2, Massachusetts.

Ruch, T. C. *Handbook of the primates including a supplement to Bibliographia Primatologica.* (To be published) Address requests for data to Department of Physiology and Biophysics, University of Washington, School of Medicine, Seattle 5, Washington.

AIBS Bulletin 4 (No. 1) pp. 28–29: (No. 2) pp. 20–22. 1954.

TABLE 2—USERS OF LABORATORY ANIMALS

Abbreviations used in Table 2

M—male; F—Female; Ck—Cockerel; gm.—Grams; kg.—Kilograms; oz.—ounces; lbs.—pounds; da.—days; wk.—weeks; mo.—months; YA—young adults; A—adult; W—weanlings; sus.—susceptible; res.—resistant; wt.—weight; Temp.—temperature; Vit.—vitamin; AKC—American Kennel Club; P.B.—Pure Bred; Vacc.—vaccinated; Preg.—pregnant; NZ-New Zealand.

Number used per month is expressed in hundreds, thus 20 represents 2,000, etc.

Blank spaces in this table indicate that information was not available. In the last column, blanks may also indicate that insignificant numbers of the animals are used.

AN MAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Abbott Laboratories, 14th and Sheridan Road, North Chicago, Illinois Dr. Robert D. Coghill, Director of Research					
Rats*	F	35–42 gm.	20 da.	Non-pregnant	20
	M or F	100–150 gm.			
Mice	M or F	20–25 gm.		F. non-pregnant CF1 strain	60
	M or F	18–20 gm.		F. non-pregnant	
Rabbits	M or F	3½–4 lbs.		Healthy, non-pregnant	
Cavies	F	6–10 oz.		Virgin	
	M	12–14 oz.			
Dogs	M or F	25–30 lbs.		Short hair	
Cats	M or F	5–8 lbs.	YA	Non-preg. or lactating	
Chickens	M or F	3½–4 lbs.		White Leghorn	
Chicks	M		1 da.	White Leghorn	
				Barred Rock	
Chick embryos					2 doz.
Turkeys	M		Poults	Broad-breasted Bronze	
Pigeons	M or F		6 mo. or older	Adult	
American Can Co., Research Division, 11th Ave. and St. Charles Rd., Maywood, Illinois Margaret Ives, Head Biochemist					
Mice, rats, cavies, monkeys.					
American Meat Institute Foundation, 939 East 57th Street, Chicago, Illinois Dr. H. R. Krabill, Director Education and Research					
Rats, rabbits, hamsters, dogs, chickens.					
American Scientific Laboratories, Inc., 4001 Sherman Avenue, P. O. Box 232, Madison 1, Wisconsin Dr. Philip G. White, Director of Research					
Rats				All same sex and weight in a shipment	
Mice		12–16 gm.		Swiss-Webster strain, all same sex in shipment	4
Rabbits				Albinos	
Cavies		250–300 gm.		All same sex in shipment	
Ferrets			Less than 6 mo.	Fully sus. to virus of Carré	
Chickens				Variable, depending on use	10
Chick embryos				From White or Gray Leghorn laying flocks. U.S. pullorum clean or equivalent. Flock may not have past history of Newcastle, chronic respiratory or Pullorum disease. Egg wt. 22–28 oz. per doz.	30

* Maintains colony, purchases a few.

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Amherst College, Amherst, Massachusetts Dr. G. W. Kidder, Stone Professor of Biology					
Rats	M or F				
Mice*				Adenocarcinoma sus. C 57 BL	
Triturus (collected in field), Protozoa and Drosophila maintained in colonies.					
University of Arkansas, Department of Animal Industry, Fayetteville, Arkansas John White, Director of Research Warren Gifford, Dept. of Animal Industry and Veterinary Science					
Rats, Rabbits, Cavies, pigs (coeff. inb. .65), chickens, chick embryos, sheep cattle.†					
Armour Laboratories, 1425 W. 42nd Street, Chicago 9, Illinois Dr. E. E. Hays, Director of Research N. Ercoli, Director, Dept. Pharmacology and Chemotherapy					
Rats	F	50–55 gm.	21 da.		4
Mice	F	18–20 gm.	30 da.	Albino	12
	F	18–20 gm.	30 da.	DBA/2	
	F	18–20 gm.	30 da.	C 3 H	
	F	18–20 gm.	30 da.	C57 BL/6	
Cavies					1
Rabbits, cats, frogs, pigeons, chickens					
Bower and Black Research Laboratory, 2500 S. Dearborn Street, Chicago, Illinois P. Zeigler, Director of Research					
Rats, mice, rabbits, frogs, cavies.					
Don Baxter, Inc., 1015 Grandview, Glendale, California Dr. Arthur Cherkin, Director of Research					
Rats	M and F		W. or YA	Litter mates	
Mice	M	18–35 gm.		Good health, not sus. to cancer	2
Rabbits	F	2–3 kg.	YA	Good health, docile, free from undue temperature variations	
Cavies	M and F	250–350 gm.		Good health	
Cats	M and F		A	Good health	
Beacon Milling Company, Inc., Cayuga, New York Clarence E. Lee, Director of Research					
Ducks					2–8
Turkeys					Up to 12
Rabbits and dogs.					

* Maintains own colony.
† Maintained at station.

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Borden's Nutritional Research Laboratory and Experimental Farm, P. O. Box 533, Elgin, Illinois Dr. Hartley W. Howard, Director of Research Dr. W. Anderson, Jr. Technical Service Director					
Rats		40–50 gm.	W	Res. to disease, suitable for growth and assay studies, vitamin D and A depletion studies; litter mate identification	1
Dogs		Normal for breed and age	1 da. to 8 wk.	AKC registration required, must conform to AKC breed specifications	
Pigs		Standard for breed and age	10 da. to 8 wk.	Fast growth and res. to disease. Disease free at time of purchase and vacc. for erysipelas and cholera	
Chickens	M or F	Not less than 36 gm.	1 da.	Parent stock of uniform and rapid growth, early feathering, normal disease res., pullorum free, uniform in general body characteristics, if purebred must conform to breed specifications	
Turkeys	Specified		1 da.	Same as for chickens	
Bristol Laboratories, Inc., Thompson Road, Syracuse 1, New York A. R. Menotti, Director of Research					
Rats	M	125–150 gm.			2
Mice	M	18–20 gm.			8
Rabbits	M or F	5–6 lbs.			
Cavies	M or F	Mature		Virgin	
Dogs	M or F	25–30 lbs.			
Cats					
Brown University, Providence 12, Rhode Island J. Walter Wilson, Director of Research					
Rats, rabbits, mice and cavies supplied by own colony.					
California Institute of Technology,* Pasadena 4, California G. W. Beadle, Director of Research Ray P. Owen, Chairman, Animal Care Committee					
Rats					7
Mice					31
Cavies					5
Rabbits					10
Cats, monkeys, chickens, hamsters, opossums, pigeons; also, maintain extensive Drosophila stocks.					
University of California,* Berkeley 4, California Dr. Wendell M. Stanley, Biochemistry and Virus Lab. Dr. Charles E. Smith, School of Public Health					
Mice†					226
Rats					199
Cavies					6
Rabbits					6
Chickens					86
Dogs					1

* Data furnished by Department of Public Health, Division of Laboratories, the figures include animals used by several departments. Specifications vary according to department and specific use for which intended.

† The Cancer Genetics Laboratory maintains a mouse colony and produces 1000–1500 a month for sale.

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
University of California, Los Angeles,* California Dr. Bennett J. Cohen, University Veterinarian					
Mice					19
Rats					35
Cavies					2
Rabbits					5
Chickens					1
Hamsters					1
Dogs and cats					
Chattanooga Medicine Company, Chattanooga, Tennessee Dr. James M. Holbert					
Mice					2
Rats, rabbits, cavies, chickens.					
Chem-Tech Laboratories, 236½ South Robertson Blvd., Beverly Hills, California Dr. Otto E. Lobstein, Director of Research					
Small number of rats, mice, rabbits, guinea pigs, and frogs used. Maintains mouse colony.					
Chemical Corps Medical Laboratories, Army Chemical Center, Maryland Edward LeB. Gray, Chief, Animal Ecology Branch					
Rats					12
Mice					10
Rabbits					12
Cavies					2
Cats					1
Frogs					1
Dogs, pigs, chickens, bull frogs, snapping turtles used in small numbers.					
Cincinnati General Hospital, Cincinnati 29, Ohio Dr. Jan Schwarz, Director Laboratory of Mycology					
Mice, Rats, Guinea pigs.					
University of Chicago,† Chicago 37, Illinois Dr. N. R. Brewer, Superintendent of Animal Quarters					
Rats					17
Mice					95
Rabbits					3
Cavies					7
Hamsters					3
Cats					
Dogs					1
Monkeys					1
Chick embryos					23
Frogs					1
Urodele Amphibia					4
Drosophila					170
Grasshoppers					5

* Data furnished by Department of Public Health, Division of Laboratories, the figure includes animals used by several departments. Specifications vary according to department and specific use for which intended.

† Summary of all Departments. Colonies of some of the animals named are maintained in certain departments. Chickens, pigs, sheep, gophers, ants, opossums, lobsters used in small numbers.

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Ciba Pharmaceutical Products, Summit, New Jersey Dr. F. F. Yonkman, Director of Research Dr. A. E. Earl, Senior Research Veterinarian					
Rats (95% raised in own colony)					2
Mice	M and F	20 gm.		Not raised on antibiotic rations	25–30
CF1, CFW C57, DBAO	Maintained in own colonies. Most mice purchased				
Cavies	F mostly				20–30/yr.
Cats	M and F	Any weight			
Dogs		10–13 kg.		Healthy beagles preferred	
Chick embryos				Eggs from hens which have not been fed antibiotics	16
Use small numbers of frogs, hamsters and Rhesus monkeys.					
Clinical Laboratory of San Bernardino, 955 D Street, San Bernardino, California E. C. Maier, Director of Research					
Frogs					1
Virgin rabbits, cavies and dogs used in small numbers.					
University of Colorado, Dept. of Biology, Boulder, Colorado Dr. Gordon Alexander, Director of Research					
Mice	M and F	20–25 gm.			
Rabbits	M and F	4–6 lbs.			
Cavies	M and F	250–400 gm.			
Few hamsters and frogs used.					
Commercial Solvents Corporation, 1331 S. First Street, Terre Haute, Indiana Jerome Martin, Director of Research					
Rats					12
Mice					16
Chickens					1
Pigs					
Rabbits, cavies, dogs, steers in small numbers.					
University of Connecticut, Agricultural Experiment Station, Storrs, Connecticut Dr. A. A. Spielman, Director of Research					
Chickens					3
Chick embryos					20
Mice (some maintained in own colony), rabbits.					
Cornell University, Animal Nutrition, Ithaca, New York C. M. McCay, Professor of Nutrition					
Maintains own animal colonies of rats, rabbits, cavies, dogs, hamsters, cotton rats, pigs and sheep.					
Cutter Laboratories, 4th and Parker Street, Berkeley, California Dr. Howard M. Winegarden, Director of Research, Ralph B. Houlihan, Director, Biological Research					
Rats	70% F 30% M	90%–100 gm. 10%–40 gm.			1
Mice		11–14 gm.			40
Rabbits		4½–10 lbs.			7
Cavies		350–450 gm.		Normal, healthy	20
Chick embryos				Incubated 10–12 da. from eggs of U. S. Pullorum-clean, U. S. Pullorum passed, or equivalent	40
Chickens			1 da.	Same as for embryos	5
Pigs					1
Pigeons, dogs and cats used in small numbers.					

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Dawe's Laboratories, 4800 S. Richmond Street, Chicago 32, Illinois James C. Fritz, Director of Research					
Chickens			1 da.	Uniform growth response	8
Turkeys			1 da.		
Few weanling rats used.					
University of Denver, Denver, Colorado Fred E. D'Amour, Director of Research					
Rats					1
Maintains own colony.					
University of Delaware, Dept. of Animal and Poultry Industry, Newark, Delaware E. F. Waller, Director of Research					
Maintains supply of chickens and cattle. Purchase turkeys.					
Distillation Products Industries, Rochester 3, New York Norris D. Embree, Director of Research Philip L. Harris, Head Biochemistry Dept.					
Rats (own colony)	M and F	40–50 gm.	W		3
Rabbits	M	2½–3 lbs.		Albino	
Chickens	Ck		1 da.	Wh. Leghorn, for vitamin A bio-assay	4
Turkeys			1 da.		
Occasionally uses cavies and mice.					
East Texas State Teacher's College, Biology Department, Commerce, Texas Elsie Bodeman, Head of Biology Dept.					
Frogs					2
Use few mice and cats; maintain own mouse colony.					
Fellows Laboratories, Research Division, 26 Christopher Street, New York 14, New York Dr. Arthur E. Meyer, Director of Research					
Rats, mice, rabbits, cavies, cats and frogs.					
Fort Dodge Laboratories, Fort Dodge, Iowa Edna Niemann, Chief Bacteriologist Dr. G. T. Edds and Dr. A. H. Killinger, Directors of Research					
Mice	M and F		3–4 wk.		15
Rabbits					
Cavies					1
Chickens					1
Small numbers of dogs, cats, pigs and sheep.					
The Glidden Company, 1825 N. Laramie Avenue, Chicago 39, Illinois Herbert C. Katz, Nutrition Chemist					
Rats					1–2

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
University of Maryland, Grayson Research Laboratory, College Park, Maryland Col. J. H. Kintner, USA (Ret.), Director					
Cavies				Pregnant females	
Cats				Suckling kittens	
Dogs			6 wks.		
Ferrets				Pregnant females	
Rats				Embryos	
Goats			2–3 mos.	Toggenburg and Saanen	
Chick embryos				White Leghorn	
Horses, hamsters (maintain own colony), mice, bats, baboons, rabbits, monkeys (Rhesus). All animals used in small numbers and at intervals except horses, hamsters, mice, cavies and cats, which are used regularly.					
Harris Laboratories, 816 P Street, Lincoln 8, Nebraska Lewis E. Harris, Director					
Rats					1
Cavies, chickens, frogs, rabbits.					
Hazleton Laboratories, Box 333, Falls Church, Virginia Dr. Lloyd W. Hazleton, Director of Research Mrs. Emily G. Holland, Project Coordinator					
Rats	M and F	80–150 gm.			4
Mice	M and F	20 gm.			3
Rabbits	M and F	2–4 lbs.			1
Cavies	M and F	250 gm.			
Dogs			6 mos.		
Hilltop Research Institute, Inc., 925 William H. Taft Road, Cincinnati 6, Ohio Harry L. Rubenkoenig, Technical Director					
Mice					4
Rabbits					1
Rats and cavies. Occasional use for dogs, hamsters and monkeys.					
Howard University College of Medicine, 520 W Street, N. W., Washington 1, D. C. Joseph L. Johnson, Dean					
Rats, mice, dogs and frogs. Small number of cavies, cats and turtles.					
Hyland Laboratories, 4501 Colorado Boulevard, Los Angeles 39, California Dr. Roy T. Fisk, Director of Control					
Mice	M and F	12–16 gm.	4–5 wks.	Swiss origin	6
Rabbits	F	1500–1800 gm.	9–10 wks.	Virgin N. Z. Whites	
Hoffman-LaRoche, Inc., Roche Park, Nutley 10, New Jersey Dr. Tit Wong, Department of Pharmacology Dr. E. L. Sevringhaus, Director of Clinical Research Dr. J. A. Aeschlimann, Director of Chemical Research					
Rats	M and F	40–50 gm.	W	Vitamin A and D depleted	2
	M	40–50 gm.	W	Vitamin A and D depleted	
	M	50–59 gm.	W	Vitamin A and D depleted	4
	M	50–75 gm.	Y		4
	M	150–200 gm.	A		5
	M and F	35 gm.	W	Sus. to myobacterium lepraemurium and endomoeba histolytica	8

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Mice (maintain own colony)					16
Rabbits	M and F	4–6 lbs.			1
Cavies	M and F	100–125 gm. 200–300 gm. 250–350 gm.		Smooth haired	1
Dogs	M and F	5–10 kg.		Beagles preferred	
Cats	M and F	3–5 lbs.			
Chicks	M and F		1 da. old	White Leghorn and N. H. Reds	1
Chick embryos				Same as above	1
Pigeons	M and F	350–500 gm.			

A few hamsters and monkeys are used.

International Hormones, Inc., 45 Bergen Street, Brooklyn, New York
Norman Bassel, Director of Research

Use rats, mice, rabbits and cavies.

State University of Iowa, Department of Anatomy, Iowa City, Iowa
W. R. Ingram, Head Anatomy Dept.

Maintains colony of rats. Use also small numbers of rabbits, cavies, cats and dogs occasionally. Specified as to sex, age and weight.

The Jewish Hospital, 216 S. Kingshighway, St. Louis 10, Missouri
Dr. Herman T. Blumenthal, Director of Research

Use rats, mice, rabbits, cavies, dogs, chickens, chick embryos and frogs. No special specifications except that animals must not have been fed antibiotics or vitamins.

Johnson and Johnson Research Foundation, New Brunswick, New Jersey
Dr. Bradford N. Craver, Director of Research
Dr. Geoffrey H. Lord, Senior Pathologist

Rats (own colony)	M and F	50 gm.; 150–250– 300 gm. for other experi- ments		For nutrition studies, hardy, little predisposition to disease for all animals	3 1
Rabbits		4 kg.			

Mice, cavies, dogs and cats used in small numbers.

University of Kansas, Endocrine Laboratory, Lawrence, Kansas
Dr. William C. Young, Director of Research
Dr. J. A. Weir, Asst. Professor Zoology

Maintain own colonies of cavies, and mice. (Mouse strains listed in Mouse News Letter No. 9, July, 1953). Surplus mouse stock available for breeding stock.

R. L. Laros Company, Broad and Wood Streets, Bethlehem, Penna.
George O. Rudkin, Director of Research
Mrs. Marie Hailperin, Biology Lab. Supervisor

Mice		15 gm.			
Rabbits		1.5–1.8 kg.		Virgin, maintained without antibiotics	
Cavies	M and F	225 gm.		Virgin females	

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	

Lobund Institute, University of Notre Dame, Notre Dame, Indiana
Dr. James A. Reyniers, Research Professor of Bacteriology

Germ free rats, cavies and dogs reared from caesarean born animals. Chickens reared from surface sterilized eggs and hatched in the Reyniers Germfree system; rabbits, hamsters, cats, monkeys and insects reared at times. Used in own and in collaborative projects.

Eli Lilly and Company, Indianapolis 6, Indiana
Dr. R. M. Rice, Director of Research
Dr. J. A. Leighty
D. F. Teeter, Head, Research Administration

Rats	M or F	From 250 gm. to preg. F. usually 20 gm. variance			35
Mice	M or F	From 30 gm. to preg. F. Wt. variance 2 gm.		Special strains as DBA, C3H, AKR, etc.	380
Rabbits	M or F	3½-12 lbs. Wt. variance ½ lb.		Pregnant and virgin females	5
Cavies	M or F	to 550 gm. wt. variance 25–50 gm.		Females (virgin)	6
Dogs	M or F	4–18 kg. wt. variance 1 to 2 kg.		Various types specified as deep-chested hound type; long neck, smooth hair	2
Hamsters				Sex, age and weight specified. Pregnant females and young adults	2
Cotton Rats				Pregnant females and young adults. Sex and age specified	
Cats		3½–5 lbs.		Sex specified	2
Chick embryos				Specified as to number of days inbated	49
Frogs		¾ oz. to jumbo			1

Smaller numbers of monkeys, chickens, pigs, sheep, toads and pigeons used. Colonies of rats and mice maintained.

Los Alamos Scientific Laboratory, Health Research Laboratory, P. O. Box 1663, Los Alamos, New Mexico
Dr. Wright H. Langham, Group Leader
Ogden S. Johnson, Asst. Group Leader

Rats	M		25–30 da.		4
Mice	F		5–7 wks.	CF1, virgin	7
	F		5–7 wks.	Swiss, sarcoma susceptible	
	F		5–7 wks.	AKR, leukemia susceptible	
	F		5–7 wks.	dba, thymoma susceptible	
	F			N. Z. White	
Rabbits					

Smaller numbers of cavies and occasionally dogs, monkeys, chickens and sheep are used. Rodents should have low incidence of paratyphoid, streptococcicosis and coccidiosis.

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Marine Products Company, 345 West First Street, Boston, Massachusetts **Edward J. Iorio, Chemist in Charge**					
Use rats and chickens.					
University of Maryland, School of Medicine, 522 W. Lombard Street, Baltimore 1, Maryland **Frank H. J. Figge, Director of Research** **H. B. Wylie, Dean** **Dietrick C. Smith, Chairman, Animal Care Committee**					
Use rats, mice, rabbits, cavies, dogs, hamsters, cats, chickens, chick embryos, frogs, and turtles. Supplied through animal quarters for various departments. Mouse colony of strains C3H, C57BL, A, I, JK, and LCS_a, maintained.					
William S. Merrell Company, Cincinnati 15, Ohio **Dr. Harold W. Werner, Director of Research**					
Rats	M and F		23–60 da.	Virgin, use a no. of litter mates, males and females. No antibiotic supplement	14
Mice	Mostly F	6–8 gm. 15–18 gm.	21–23 da.	No antibiotic supplement	9
Rabbits	M and F	2–4 lbs.		N.Z.W. no antibiotic supplement	1
Cavies, dogs, cats, monkeys, chickens and pigeons used in small numbers.					
Medical Research Institute, Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago 16, Illinois **Dr. Albert Tannenbaum, Director of Cancer Research**					
Mice (maintains colony of dba, C3H and C57BL strains) Rats					4
University of Michigan, Institute of Human Biology, Ann Arbor, Michigan **Lee R. Dice, Director**					
Peromyscus (maintains own colony)					6
Miles-Ames Research Labs., Elkhart, Indiana **Dr. L. R. Crandall, Jr. Director of Research**					
Rats Mice Cavies					2 5 1
Rabbits, dogs, cats, chickens, and frogs used in smaller numbers.					
University of Minnesota Medical School, Division of Cancer Biology, Minneapolis 14, Minnesota **Dr. John J. Bittner, Director of Research**					
Mice (maintains several inbred strains used in cancer research).					

TABLE 2—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
National Institutes of Health, Bethesda, Maryland Dr. George Jay, Jr.					
Mice					552
Rats					72
Cavies					13
Rabbits					8
Hamsters					4
Other rodents					2
Monkeys					1
Chick embryos					5 doz.
Ferrets, cats, dogs, sheep, frogs, horses.					
State University of New York, College of Medicine, 766 Irving Avenue, Syracuse 10, New York Dr. William R. Willard, Dean R. W. Drayer, Purchasing Agent					
Rats					18
Mice					10
Chickens					1
Chick embryos					10
Rabbits, cavies and dogs. Few hamsters and cats used.					
Cornell University, New York State Veterinary College, Ithaca, New York W. A. Hagan, Dean					
Mice					3
Cavies					1
Hamsters					1
Chickens					2
Chick embryos					3
Smaller numbers of rats, rabbits, dogs, ferrets, pigs, sheep, frogs and a few horses and cattle used. Mostly maintained in own animal colonies.					
North Texas State College, Biology Department, P. O. Box 5183, Denton, Texas J. K. G. Silver, Director of Biology					
Chickens					1
Few rats mice and dogs used.					
Ohio State University, Department of Zoology and Entomology, Columbus 10, Ohio Dr. Earl L. Green, Assoc. Professor of Zoology					
Mice (maintains inbred colony of several strains used in genetic research).					
Parke-Davis Company, Ft. Jos. Campau, Detroit 32, Michigan D. A. Brown, Director of Bio-Assay Division					
Mice					3
Rats					3
Dogs					1
Chickens					1
Cavies, frogs, pigeons, rabbits. Animals should be free from parasites and virus types of pneumonia.					

TABLE 2.—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Pennsylvania State College, Department of Zoology and Entomology, State College, Pennsylvania **Hubert Frings, Professor of Entomology**					
Mice (two separate strains maintained)					2
University of Pennsylvania, Philadelphia 4, Pennsylvania **Harry M. Vars, Chairman, Animal House Committee**					
Use rats, rabbits, dogs, cats. Specifications are given for sex, age, weight and for dogs, size and physical condition.					
Philadelphia College of Pharmacy and Science, 43rd Street and Woodland Avenue, Philadelphia 4 Pennsylvania **Dr. Julian L. Ambrus, Professor of Pharmacology**					
Mice					4
Rats, cavies, hamsters, dogs, chickens and frogs. In smaller numbers—cotton rats, cats, monkeys. Newts, tadpoles, earthworms, snakes, turtles used in small quantity for classroom experiments. Colony of mouse strains maintained. (See Cancer Res. 12 (8): 602–13. 1952.)					
University of Pittsburgh, Graduate School of Public Health, Pittsburgh 13, Pennsylvania **Mildred E. Stegeman, Secretary** **Dr. W. McD. Hammon, Director, Epidemiology and Microbiology** **Dr. Adolph G. Kammer, Director, Occupational Health** **Dr. Robert E. Olson, Director Biochemistry and Nutrition**					
Mice		10–15 gm. 15–20 gm. 20–22 gm.	3–4 wks.		49
					30–40 lit. per wk.
Chick embryos			2–3 da.	Suckling	40 doz.
Smaller numbers of rats, rabbits, cavies, dogs, hamsters, pigeons, monkeys and ducklings.					
Providence College, River Avenue and Eaton Street, Providence 8, Rhode Island **Dr. F. C. Hickey, Director of Research**					
Rats	M and F			Good health	
Chick embryos					
Purdue University, Biochemistry Department, West Lafayette, Indiana **S. M. Hauge, Assoc. Professor of Biochemistry**					
Rats (maintains own colony)					5
Ralston Purina Company, 835 S. Eighth Street, St. Louis 2, Missouri **H. C. Schaefer, Mgr., Nutrition Research Laboratories** **Dr. R. M. Bethke, Director of Research**					
Rats					1
Rabbits					1
Dogs					1
Pigs					2
Chickens					50
(Maintained on farm along with farm animals and a few mice and cavies).					

TABLE 2.—Continued

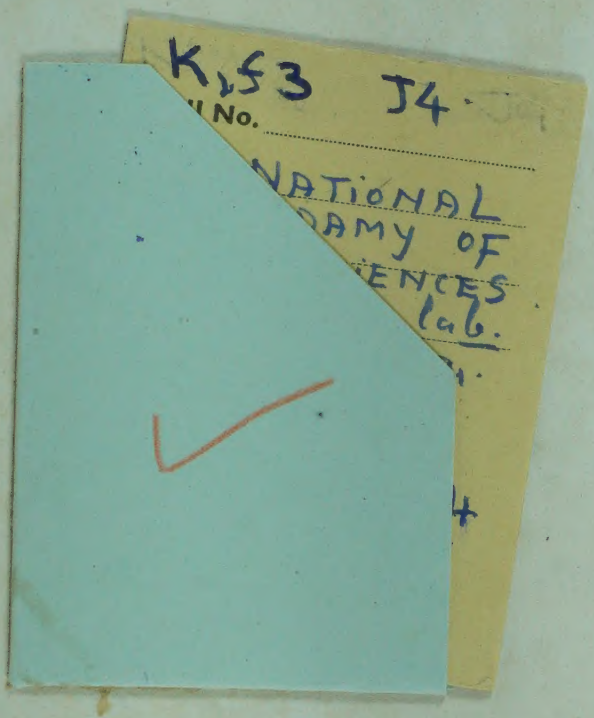
ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
University of Rochester, School of Medicine and Dentistry, Rochester 20, New York **F. S. Robscheit-Robbins, Chairman, Animal House Committee** **John W. Hein, Dentistry and Dental Research** **Herbert R. Morgan, Dept of Bacteriology** **Harold C. Hodge, Div. of Pharmacology** **Karl Mason, Dept. of Anatomy**					
Rats	M and F				10
Mice		18–20 gm.			9
Dogs	M and F	8–10 lbs.	YA	Beagles	
Chick embryos					6
Use smaller numbers of rabbits, cavies, cats, pigs, monkeys, hamsters. Maintain rat colony.					
Rutgers University, Department of Zoology, New Brunswick, New Jersey **Leslie A. Stauber, Professor of Zoology**					
Mice, hamsters, chickens. Rats, rabbits, chinchillas and ducklings used in smaller numbers.					
Schering Corporation, 2 Broad Street, Bloomfield, New Jersey **Dr. D. Papa, Director of Research** **Dr. E. B. Hershberg, Director of Research** **M. F. Spoerlein, Pharmacologist**					
Rats	M and F	40–300 gm.		Mature and immature	1–5
Mice	M	18–26 gm.		Mature and immature	50–60
Cavies	M and F	200–400 gm.		Mature	2–5
Rabbits	M	2–4 kg.		Mature and immature	1
Dogs	M and F	10–15 kg.		Mature and immature	1
Cats	M and F	4–5 kg.		Mature	1
Use a few monkeys.					
G. D. Searle and Company, P. O. Box 5110, Chicago 80, Illinois **Dr. A. L. Raymond, Director of Research** **Francis J. Saunders, Chief Endocrinologist**					
Rats					20
Mice					20
Rabbits					1
Cats					1
Frogs					1
Dogs. Few cavies and hamsters used. Definite specifications as to weight, age, and sex depending on particular test or assay. In some cases strain is specified for mice.					
Sharp and Dohme, Division of Merck and Company, Inc., Biological Production Division, Glenolden, Pennsylvania **E. S. Barclay, Acting Director, Biological Laboratories**					
Mice	M and F	10–12 gm. 16–20 gm. 18–21 gm.	4 wks. 6 wks. Mature	Disease free, not fed antibiotics, rapid wt. gains, high antigenic response	75
Rabbits	M and F		5 lbs. 6–8 lbs. 8–10 lbs.		35
Chick embryos				From large white eggs, Pullorum free flock, no antibiotics	300 to 500
Use smaller numbers of cavies, chickens and sheep.					

TABLE 2.—Continued

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Sloan-Kettering Institute for Cancer Research,* 410 E. 67th Street, New York 21, New York **Dr. C. P. Rhoads, Director of Research**					
Mice					92
Rats					24
Hamsters					1
Chickens					8
Dogs, cavies, rabbits, cats, monkeys, pigs.					
* Summary of animals used by several departments.					
Smith, Kline and French Laboratories, 1530 Spring Garden Street, Philadelphia, 1, Penna. **Dr. Robert T. Conner, Director of Research**					
Rats	M	125–250 gm.		Fairfield strain	95
Mice	M and F	18–22 gm.		CF1 or Swiss	115
Dogs	M and F	10 kg.			
Smaller numbers of rabbits, cavies and cats.					
Carroll Dunham Smith, 401 Codwise Avenue, New Brunswick, New Jersey **Jerome F. Grattan, Director of Research** **Anthony W. Pircio, Senior Pathologist**					
Rats	M and F	40–60 gm.	30 days	Vitamin D deficient	1
		90–110 gm.	90 days	Normal	
		100–130 gm.	100–110 da.	Normal	
Smaller numbers of rabbits, cavies and pigeons used and occasionally cats and dogs.					
Foster D. Snell, Inc., 29 W. 15th Street, New York 11, New York **Dr. A. Haldane Gee, Director, Bacteriology and Toxicology**					
Use a few rats, mice, rabbits, and cavies. Specified as to sex, weight and in good health.					
Foster D. Snell, Inc., Supplee Division, Bainbridge, New York **Esther L. Clark, Director of Research** **Richard L. Moore, Assistant Treasurer**					
Rats	M and F	21–28 gm.	W	Low vitamin D diet	12
	M and F	200–300 gm.	3–4 mos.	Complete ration	
Superior Feed Mills, P. O. Box 4217, Capital Hill Station, Oklahoma City 10, Oklahoma **Joe P. Davis, Director of Research**					
Chickens					1
Use few rabbits.					
Texas A. and M. College, School of Veterinary Medicine, College Station, Texas **John P. Delaplane, Director of Research**					
Chick embryos				Eggs white shell, stock free from infection	2
Use a few mice, cavies, rabbits and chickens. Specified as to age, weight and in good health.					

TABLE 2.—Concluded

ANIMAL	SPECIFICATIONS				NUMBER USED PER MO.
	SEX	WEIGHT	AGE	OTHER SPECIFICATIONS	
Warner-Chilcott Laboratories, 113 W. 18th Street, New York City, New York **G. H. Mangun, Director of Research** **Eliot Steinberg, Supervisor, Laboratory Facilities**					
Rats					1
Mice					26
Rabbits					1
Cavies					1
Chick embryos					5–10
Few dogs, cats and occasionally some chickens and monkeys used. Specified as to sex, age, weight, and susceptibilities. Maintain rat colony.					
Wellcome Research Labs., Tuckahoe 7, New York **Dr. E. J. deBeer, Acting Director**					
Rats	M	45–60 gm. 125–150 gm.			6
Mice	M	17–21 gm.			1
Rabbits	M and F				
Use few cavies, dogs, cats, chickens, frogs and pigeons.					
Wyeth Laboratories, Inc., Mason, Michigan **Dr. R. M. Tomorelli, Senior Investigator** **Dr. F. W. Bernhart, Director of Research**					
Rats			W		
Wyeth Institute of Applied Biochemistry, 900 N. Broad Street, Philadelphia 30, Pennsylvania **Dr. Joseph Seifter, Director of Research**					
Use rats, mice, rabbits, cavies, dogs, cats, chickens, chick embryos and frogs.					
Lederle Laboratories Division, Pearl River, New York **Dr. B. W. Carey, Director of Research**					
Use mice, rats, hamsters, cavies, rabbits, cats, dogs, monkeys, chimpanzees.					


K1.53 J4
No.
NATIONAL
AMY OF
ENCES
lab.